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|   |                               | 60/228,924 | 30 August 2000 (30.08.2000)   | US                             |    |
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| 60/179,065  | 31 January 2000 (31.01.2000)  | US         | 60/229,287                    | 1 September 2000 (01.09.2000)  | US |
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| 60/184,664  | 24 February 2000 (24.02.2000) | US         | 60/229,513                    | 5 September 2000 (05.09.2000)  | US |
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WO 01/55314 A2

(54) Title: NUCLEIC ACIDS, PROTEINS, AND ANTIBODIES

(57) Abstract: The present invention relates to novel digestive system related polynucleotides and the polypeptides encoded by these polynucleotides herein collectively known as "digestive system antigens", and the use of such digestive system antigens for detecting disorders of the digestive system, particularly the presence of cancer and cancer metastases. More specifically, isolated digestive system associated nucleic acid molecules are provided encoding novel digestive system associated polypeptides. Novel digestive system polypeptides and antibodies that bind to these polypeptides are provided. Also provided are vectors, host cells, and recombinant and synthetic methods for producing human digestive system associated polynucleotides and/or polypeptides. The invention further relates to diagnostic and therapeutic methods useful for diagnosing, treating, preventing and/or prognosing disorders related to the digestive system, including cancer, and therapeutic methods for treating such disorders. The invention further relates to screening methods for identifying agonists and antagonists of polynucleotides and polypeptides of the invention. The present invention further relates to methods and/or compositions for inhibiting the production and function of the polypeptides of the present invention.



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(74) Agents: **HOOVER, Kenley, K. et al.**; Human Genome Sciences, Inc., 9410 Key West Avenue, Rockville, MD 20850 (US).

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## Nucleic Acids, Proteins, and Antibodies

[001] This application refers to a "Sequence Listing" that is provided only on electronic media in computer readable form pursuant to Administrative Instructions Section 801(a)(i). The Sequence Listing forms a part of this description pursuant to Rule 5.2 and Administrative Instructions Sections 801 to 806, and is hereby incorporated in its entirety.

[002] The Sequence Listing is provided as an electronic file (PC002PCT\_seqList.txt, 9,710,493 bytes in size, created on January 12, 2001) on four identical compact discs (CD-R), labeled "COPY 1," "COPY 2," "COPY 3," and "CRF." The Sequence Listing complies with Annex C of the Administrative Instructions, and may be viewed, for example, on an IBM-PC machine running the MS-Windows operating system by using the V viewer software, version 2000 (see World Wide Web URL: <http://www.fileviewer.com>).

### *Field of the Invention*

[003] The present invention relates to novel digestive system related polynucleotides, the polypeptides encoded by these polynucleotides herein collectively referred to as "digestive system antigens," and antibodies that immunospecifically bind these polypeptides, and the use of such digestive system polynucleotides, antigens, and antibodies for detecting, treating, preventing and/or prognosing disorders of the digestive system, including, but not limited to, the presence of cancer and cancer metastases. More specifically, isolated digestive system nucleic acid molecules are provided encoding novel digestive system polypeptides. Novel digestive system polypeptides and antibodies that bind to these polypeptides are provided. Also provided are vectors, host cells, and recombinant and synthetic methods for producing

human digestive system polynucleotides, polypeptides, and/or antibodies. The invention further relates to diagnostic and therapeutic methods useful for diagnosing, treating, preventing and/or prognosing disorders related to the digestive system, including cancer, and therapeutic methods for treating such disorders. The invention further relates to screening methods for identifying agonists and antagonists of polynucleotides and polypeptides of the invention. The invention further relates to methods and/or compositions for inhibiting or promoting the production and/or function of the polypeptides of the invention.

### *Background of the Invention*

[004] The Human Digestive System is a collection of specialized organs and body tissues that prepare food for use by hundreds of millions of body cells. Food when eaten cannot reach cells because it cannot pass through the intestinal walls to the bloodstream and, if it could would not be in a useful chemical state. The gut modifies food physically and chemically and disposes of unusable waste. Physical and chemical modification (digestion) depends on exocrine and endocrine secretions and controlled movement of food through the digestive tract.

[005] The three fundamental processes of the Digestive System are: Secretion (e.g., delivery of enzymes, mucus, ions and the like into the lumen, and hormones into blood), Absorption (e.g., transport of water, ions and nutrients from the lumen, across the epithelium and into blood), and Motility (e.g., contractions of smooth muscle in the wall of the tube that crush, mix and propel its contents). Control of digestive function is achieved through a combination of electrical and hormonal messages which originate either within the digestive system's own nervous and endocrine systems, as well as from the central nervous system and from endocrine organs such as the adrenal gland.

[006] The digestive system is composed of the digestive or alimentary tube and accessory digestive organs, which include the Mouth (e.g., tongue, taste buds, soft palate pharynx, salivary glands, teeth), Esophagus, Stomach, Liver, Gallbladder, Pancreas, Small Intestine (e.g., duodenum, jejunum, and ileum), and Large Intestine (e.g., caecum).

- [007] Common digestive system disorders including infections, inflammations, ulcers and cancers of the the digestive or alimentary tube and above listed accessory digestive organs are described in more detail below.

### *Disorders of the Esophagus*

- [008] Disorders of the Esophagus include dysphagia (e.g., difficulty in swallowing) and odynophagia (e.g., difficulty in swallowing accompanied by pain). Dysphagia may be prominent in cases of degenerative disease of the central nervous system, especially of the ganglia at the base of the brain. Congenital disorders of the esophagus are most often seen in infancy, primarily as a failure to develop normal passageways. The lower end of the esophagus is subject to various developmental anomalies that shorten the organ so that the stomach is pulled up into the thoracic cavity. Anomalies of the diaphragm may contribute to a similiar outcome. Inflammatory disorders of the esophagus result from a variety of causes; for example, ingestion of noxious materials (e.g., corrosive esophagitis), lodgment of foreign bodies, or a complex of events associated with reflux of gastric contents from the stomach into the lower esophagus (e.g., peptic esophagitis).

- [009] Disorders of the motility of the esophagus tend to be either precipitated or aggravated at times of nervous stress. A disorder commonly due to obesity is gastric reflux. Persisting reflux of gastric contents with acid and digesting enzymes leads to chemical inflammation of the lining of the esophagus and ultimately to (peptic) ulceration. If inadequately treated, the process leads to submucosal fibrosis and stricturing, and, besides the symptoms of heartburn and regurgitation, the patient experiences pain on eating and swallowing.

- [010] Pouches in the walls of the structures in the digestive system that occur wherever weak spots exist between adjacent muscle layers are called diverticula. In the upper esophagus, these may occur in the area where the striated constrictor muscles of the pharynx merge with the smooth muscle of the esophagus just below the larynx. Small diverticula just above the diaphragm sometimes are found after the introduction of surgical instruments into the esophagus. A serious injury to the esophagus is spontaneous rupture. It can occur in patients who have been vomiting or retching and in debilitated elderly persons with chronic lung disease. A rupture of this type confined

to the mucosa only at the junction of the linings of the esophagus and stomach is called a Mallory-Weiss lesion.

- [011] Benign tumors of the esophagus originate in the submucosal tissues and principally are leiomyomas (tumors composed of smooth muscle tissue) or lipomas (tumors composed of adipose, or fat, tissues). Malignant tumors are either epidermal cancers, made up of unorganized aggregates of cells, or adenocarcinomas, in which there are gland-like formations. Cancers arising from squamous tissues are found at all levels of the organ, whereas adenocarcinomas are more common at the lower end where a number of glands of gastric origin are normally present. The prognosis is poor because diagnosis is difficult and the tumor has usually been growing for one or two years before symptoms are apparent.

#### *Disorders of the stomach*

- [012] Any disorder that affects the power of coordination of the stomach muscles is capable of producing symptoms ranging from those that are mildly unpleasant (e.g., anorexia and nausea) to others that are life-threatening. The intrinsic muscles of the stomach are innervated by branches of the vagus nerves, which travel along the esophagus from their point of emergence in the brain stem. Severing these nerves or altering their function by the use of anticholinergic medication may produce temporary or more prolonged change in the ability of the stomach to empty itself. Gastric retention may result from the degeneration of the nerves to the stomach that can result from diabetes mellitus. Obstruction due to scarring in the area of the gastric outlet, or to tumors encroaching on the lumen, causes the stomach to fill up with its own secretions as well as with partially digested food. In these circumstances, vomiting leads to dehydration and to electrolyte losses, which threaten life if not corrected.

- [013] Disorders of the stomach include, ulcerative diseases, which involve mucosal breakdown either confined to the superficial layers of the mucosa (e.g., an erosion) or extending through the intrinsic layer of muscle of the mucosa into the tissues below (e.g., an ulcer). The circumstances that contribute to mucosal injury and ulcer formation include physical and chemical trauma that result from hot fluids and food, aspirin and other drugs, irritating spices, and pickling fluids. In addition, genetic factors are involved in the development of ulcers. The complications of peptic ulcers



are hemorrhage, perforation, and obstruction of the outlet of the stomach (pyloric stenosis) by scarring of the duodenal bulb or of the pyloric channel. A diffuse inflammation of the stomach lining, gastritis, is usually an acute process caused by contaminated food, alcohol abuse, or by bacterial- or viral-induced inflammation of the gastrointestinal tract (gastroenteritis). The other form of gastritis is gastric atrophy, in which the thickness of the mucosa is diminished. Diffuse gastric atrophy leads to partial loss of the glands and secreting cells throughout the stomach and may be associated with iron-deficiency anemia.

- [014] Malignant tumors of the stomach are common and are probably a result of both genetic and environmental factors. Gastric cancer affects men more often than women and accounts for about 20 percent of all deaths from cancers of the gastrointestinal tract in the United States. Other malignant tumors that involve the stomach are tumors ordinarily made up of lymphoid and connective tissue. Benign tumors, especially leiomyomas, are common and may, when large, cause massive hemorrhage. Polyps of the stomach are not common except in the presence of gastric atrophy.

#### *Disorders of the Duodenum and Small Intestine*

- [015] Primary cancer of the duodenum is an infrequent disease, however, benign tumors of the duodenum particularly polyps and carcinoids, are more frequent. Cancers of the common bile duct or of the pancreas are important causes of death. A common disorder of the small intestine, distension, is caused by lack of coordination of the inner circular and outer longitudinal muscular layers of the intestinal wall which usually results in an accumulation of excess contents in the lumen. The most common cause of disturbed motility in the small intestine is food that contains an unsuitable additive, organism, or component. One of the most serious problems in small intestine are motor disturbances which arise from an intestinal obstruction that results from an actual encroachment on the bowel by an adhesive band or from an internal block produced by a tumor or gallstone. In addition, as profound an obstruction results when a portion of the intestine undergoes partial necrosis, or death, from failure of its blood supply.

- [016] The extremely common disorder known as the irritable bowel syndrome is probably due to a disturbance of the motility of the whole intestinal tract. The

symptoms vary from watery diarrhea to constipation and the passage of stools with difficulty. When the colon is involved, an excess of mucus is often observed in the stools. Occasionally the irritable bowel syndrome may be due to an allergy to a particular foodstuff. The syndrome may develop following an infection such as bacillary dysentery, after which the small intestine remains irritable for many months.

[017] A further disorder, malabsorption occurs when the small intestine is unable to transport properly broken down products of digestive materials from the lumen of the intestine into the lymphatics or mesenteric veins, where they are distributed to the rest of the body. Defects in transport occur either because the absorptive cells of the intestine lack certain enzymes, whether by birth defect or by acquired disease, or because they are hindered in their work by other disease processes that infiltrate the tissues, disturb motility, permit bacteria to overpopulate the bowel, or block the pathways over which transport normally proceeds. A malabsorption disorder of unknown cause, tropical sprue, is associated with partial atrophy of the mucosa of the small intestine.

[018] Several disorders of the small intestine are congenital. For example, Meckel's diverticulum is a common congenital malformation that occurs when the duct leading from the navel to the small intestine in the fetus fails to atrophy and close. Another congenital problem in the small intestine is the presence of multiple diverticula, or outpouchings of mucosa and serosa. A third congenital malformation is a failure of complete rotation of the small and large intestine, which is a normal step in the development of the fetus. This can result in abnormal intestinal attachments with a subsequent risk of obstruction when the intestine twists around the attachments.

[019] Disorders of the small intestine also include bacterial and parasitic infections. Traveler's diarrhea (e.g., diarrhea which is watery, accompanied by cramps, and lasts a few days) is most often caused by toxin-generating *Escherichia coli*, and less often by other organisms. Such diarrhea generally disappears spontaneously with abstention from food accompanied by drinking of nonalcoholic fluids. Species of *Salmonella* that cause typhoid and paratyphoid remain endemic in some countries and, together with *Shigella*, are occasional causes of epidemics in institutions. Cholera, caused by *Vibrio cholerae*, is endemic to Southeast Asia and periodically becomes pandemic. In equatorial countries, parasitism is endemic, with Roundworms, tapeworms, amoebae,

hookworms, strongyloides, threadworms, and blood flukes (schistosomiasis) being the main types of parasites. Roundworms, or *Ascariasis lumbricoides* interfere with the absorption of fat and protein in the intestine, which causes diarrhea. Hookworm, or *Ancylostoma duodenale*, infection deplete the body of nutrients, and a major effect is severe chronic iron-deficiency anemia. Threadworms, or *Enterobius vermicularis*, live mainly in the cecum and cause anal itching. Common tapeworms are *Taenia saginata*, found in beef, and *T. solium*, found in pork. Larvae of *Echinococcus granulosus*, *Diphyllobothrium* species, and some dwarf tapeworms also cause disease. Tapeworms found in beef and pork only give rise to symptoms if their number and size cause intestinal obstruction. *Diphyllobothrium latum*, a fish tapeworm, may cause a severe anemia similar to pernicious anemia, because it consumes most of the vitamin in the diet of the host.

[020] Appendicitis is an inflammation of the vermiform appendix that may be caused by infection or partial or total obstruction. Chronic inflammations of the small intestine include tuberculosis and regional enteritis (Crohn's disease). Celiac disease causes damage to the mucosa of the small intestine, though it is not clear whether it is caused by an immune reaction, or an inability to break down a toxic protein, gluten, to smaller peptide fractions. Studies of the immune function of those with celiac disease suggest that at least a major part of the process is a delayed hypersensitivity reaction and that the morphological changes are correlated with the presence of circulating antibodies to gluten. The mucosal reaction results in progressive atrophy, with dwarfing, if not complete disappearance, of the microvilli and villi that line the intestinal tract.

#### *Disorders of the Large Intestine*

[021] A wide variety of diseases and disorders occur in the large intestine. Imperfect fetal development may result in an anus that has no opening, a defect that requires major plastic surgery to correct. Abnormal rotation of the colon is fairly frequent and occasionally leads to disorders. Unusually long mesenteries (the supporting tissues of the large intestine) may permit recurrent twisting, cutting off the blood supply to the involved loop. Brain disease, metabolic failure, or drugs can dull the normal signals that give rise to the urge to defecate. Poor abdominal musculature or a poor pelvic floor makes it difficult to mobilize effective pressures to bring about defecation.

[022] A disease that is analogous to achalasia of the esophagus is an idiopathic condition called aganglionic megacolon, or Hirschsprung's disease. It is characterized by the absence of ganglion cells and normal nerve fibres from the distal (or lower) portion of the large intestine, which results in reduced neuromuscular transmission and ceased peristalsis. The entire colon slowly becomes more and more distended and thick-walled. A related disorder, acquired megacolon, is commonly caused by a combination of faulty toilet training and emotional disorders during childhood, in which the child withholds defecation. This starts a cycle of the administration of increasing amounts of laxatives with, ultimately, damage to the intrinsic innervation in the intestinal wall. A huge, dilated rectum full of feces develops over the years and act as an obstruction, leading to voluminous dilatation of the whole colon in some cases. The same phenomenon is occasionally encountered in those with schizophrenia and severe depression.

[023] Abscesses in the perianal area are common complicating features of many diseases and disorders of the large intestine. Fungal and bacterial infections are also common causes of large intestine disorders. Fungal infections of the moist and poorly cleansed area around the anus permit the maceration of tissue and the invasion by bacteria from the skin and colon. The colon may become inflamed and ulcerate because of invasion by pathogenic, or disease-causing, bacteria or parasites, or viral infection. For example, *Shigella* species may attack the mucous membrane of the colon and produce an intense but rather superficial hemorrhage; *Salmonella* species may damage the lymph follicles of the colon, but do not produce a generalized inflammation of the colon; cytomegalic virus can cause a severe colitis producing ulcerations; *Lymphopathia venereum* can cause a more generalized and superficial colitis; and *Entamoeba histolytica* lodge in the cecum and ascending colon, undermine the mucosal coat, and may create large ulcerations that bleed impressively.

[024] The most common form of chronic colitis, ulcerative colitis, is idiopathic. It varies from a mild inflammation of the mucosa of the rectum, giving rise to excessive mucus and some spotting of blood in the stools, to a severe, sudden, intense illness, with destruction of a large part of the colonic mucosa, considerable blood loss, toxemia and, less commonly, perforation. The most common variety affects only the rectum and sigmoid colon and is characterized by diarrhea and the passage of mucus.

Apart from the greater tendency for fistulas to form and for the wall of the intestine to thicken until the channel is obstructed, Crohn's disease is distinguishable from ulcerative colitis by microscopic findings. In Crohn's disease, the maximum damage occurs beneath the mucosa, and lymphoid conglomerations, known as granulomata, are formed in the submucosa. Crohn's disease attacks the perianal tissues more often than does ulcerative colitis. Although these two diseases are not common, they are disabling.

[025] Tumors of the colon are usually polyps or cancers. A peculiar form of polyp is the villous adenoma, often a slowly growing, fernlike structure that spreads along the surface of the colon for some distance. In the West, cancer of the colon is a more common tumor than is cancer of the stomach, and it occurs about equally in both sexes. Cancers compress the colonic lumen to produce obstruction, they attach to neighbouring structures to produce pain, and they perforate to give rise to peritonitis. Cancers also may metastasize to distant organs before local symptoms appear.

[026] Anorectal disorders related to defecation are more common in the Western world than elsewhere. These disorders usually take the form of fissures (cuts or cracks in the skin or mucous membrane) at the junction of the anal mucous membrane with the skin between the thighs. Anal fistulas sometimes occur as complications of serious bowel disease, as in tuberculosis or Crohn's disease of the bowel, or in certain parasitic diseases. A more general disorder is the enlargement of veins of the rectum and anus to form external or internal hemorrhoids. Hemorrhoids protrude, are associated with anal itching and pain, and bleed, especially when they come in contact with hard stools.

### *Disorders of the Liver*

[027] A variety of agents, including viruses, drugs, environmental pollutants, genetic disorders, and systemic diseases, can affect the liver. The resulting disorders usually affect one of the three functional components of the liver: the hepatocyte (liver cell) itself, the bile secretory (cholangiolar) apparatus, or the blood vascular system. Most acute liver diseases are self-limited, and liver functioning returns to normal once the causes are removed or eliminated. In some cases, however, the acute disease process destroys massive areas of liver tissue in a short time, leading to extensive death

(necrosis) of hepatic cells and often to death of the patient. Hepatitis may result from viral infections or toxic damage from drugs or poisons. When acute hepatitis lasts for six months or more, a slow but progressive destruction of the surrounding liver cells and bile ducts occurs, a stage called chronic active hepatitis. If hepatocellular damage is severe enough to destroy entire acini (clusters of lobules), they are often replaced with fibrous scar tissue. Bile canaliculi and hepatocytes regenerate in an irregular fashion adjacent to the scar tissue and result in a chronic condition called cirrhosis of the liver. Where inflammatory activity continues after the onset of cirrhosis, the disorderly regeneration of hepatocytes and cholangioles may lead to the development of hepatocellular or cholangiolar cancer.

[028] Although a number of viruses affect the liver, including the cytomegalovirus of infancy and childhood and the Epstein-Barr virus of infectious mononucleosis, there are three distinctive transmissible viruses that are specifically known to cause acute damage to liver cells: hepatitis virus A (HAV), hepatitis virus B (HBV), and hepatitis virus non-A, non-B (NANB). The hepatitis A virus is transmitted almost exclusively by the fecal-oral route, and it thrives in areas where sanitation and food handling are poor and hand washing is infrequent. Hepatitis B virus is present throughout the world in asymptomatic human carriers who may or may not have ongoing liver disease and formerly, the disease was widely spread by the transfusion of whole blood or blood products. The hepatitis NANB virus has not been isolated, and currently is the major cause of posttransfusion hepatitis. The symptoms characteristic of the acute hepatitis caused by the HAV, HBV, and NANB viruses are essentially indistinguishable from one another.

[029] Acute hepatitis also may be caused by the overconsumption of alcohol or other poisons, such as commercial solvents (e.g., carbon tetrachloride), acetaminophen, and certain fungi. Such agents are believed to cause hepatitis when the formation of their toxic intermediate metabolites in the liver cell (phase I reactions) is beyond the capacity of the hepatocyte to conjugate, or join them with another substance for detoxification (phase II reactions) and excretion. As long as the levels of these agents are small enough to permit complete phase I and phase II reactions, there is no damage to the liver cell. Acute canalicular (cholestatic) hepatitis is most commonly caused by certain drugs, such as chlorpromazine, that lead to idiosyncratic reactions or, at times,



by hepatitis viruses. Acute congestive liver disease usually results from the sudden engorgement of the liver by fluids after congestive heart failure.

[030] Chronic active hepatitis, the result of unresolved acute injury, is associated with ongoing liver damage. A milder form of chronic disease, called persistent hepatitis, does not appear to lead to progressive liver damage despite evidence of a continuing mild inflammation. These conditions may result from viral hepatitis, drug-induced hepatitis, autoimmune liver diseases (lupoid hepatitis), or congenital abnormalities. A prominent autoimmune liver disease is Wilson's disease, which is caused by abnormal deposits of large amounts of copper in the liver. Granulomatous hepatitis, a condition in which localized areas of inflammation (granulomas) appear in any portion of the liver lobule, is a type of inflammatory disorder associated with many systemic diseases, including tuberculosis, sarcoidosis, schistosomiasis, and certain drug reactions. Granulomatous hepatitis rarely leads to serious interference with hepatic function, although it is often chronic.

[031] The end result of many forms of chronic liver injury is cirrhosis, or scarring of liver tissue in response to previous acinar necrosis and irregular regeneration of liver nodules and bile ducts. Among the congenital disorders producing cirrhosis are Wilson's disease, hemochromatosis (over-deposition of iron pigment), cystic fibrosis, biliary atresia (congenital absence of a part of the bile ducts), and alpha<sub>1</sub>-antitrypsin deficiency, or the congenital absence of a proteolytic enzyme inhibitor that results in the accumulation of abnormal forms of carbohydrate in hepatocytes. In the West, cirrhosis of the liver most commonly results from chronic heavy intake of alcohol, while chronic viral hepatitis is probably the leading cause of cirrhosis in underdeveloped countries. Primary biliary cirrhosis, a widespread, though uncommon, autoimmune inflammatory disease of bile ducts, is a disorder primarily affecting middle-aged and older women. Secondary biliary cirrhosis results from chronic obstruction or recurrent infection in the extrahepatic bile ducts caused by strictures, gallstones, or tumors. Infestation of the biliary tract with a liver fluke, *Clonorchis sinensis*, is a cause of secondary biliary cirrhosis in Asia. Cirrhosis occasionally is the result of chronic vascular congestion of the liver in persons with prolonged heart failure and in those with chronic obstruction of the hepatic veins caused by benign blood clots or metastatic cancer.

[032] Hepatic encephalopathy refers to the changes in the brain that occur in patients with advanced acute or chronic liver disease. If liver cells are damaged, certain substances that are normally cleansed from the blood by the healthy liver are not removed. In the case of cirrhosis, blood from the portal system is not exposed to functioning hepatocytes because it is transported through blood vessels in the liver that do not run through regenerating nodules of hepatocytes; owing to the atypical growth inherent in the cirrhotic process. These products of cell metabolism are primarily nitrogenous substances derived from protein, especially ammonia, or possibly certain straight-chain fatty acids. They pass to the brain where they damage functioning nervous tissue or subvert the actions of neurotransmitters, chemical messengers that carry impulses from one brain cell to another. In acute diseases, the brain exposed to those agents becomes swollen to the point where normal breathing may cease. Chronic exposure can lead to destruction of nerve cells with replacement by scar tissue (gliosis).

[033] Portal hypertension, the increased pressure in the portal vein and its tributaries that is the result of impediments to venous flow into the liver, is brought about by the scarring characteristic of the cirrhotic process. The increased pressure causes feeders of the portal vein to distend markedly, producing varices, or dilations of the veins. When varices are located in superficial tissues, they may rupture and bleed profusely. Two such locations are the lower esophagus and the perianal region. The accumulation of fluid in the abdominal cavity, or ascites, is related to portal hypertension, significant reduction in serum albumin, and renal retention of sodium. When albumin levels in blood are lower than normal, there is a marked reduction in the force that holds plasma water within the blood vessels and normally resists the effects of the intravascular pressure. The resulting increase in intravascular pressure, coupled with the increased internal pressure caused by the portal venous obstruction in the liver, leads to massive losses of plasma water into the abdominal cavity. The associated reduction of blood flow to the kidneys causes increased elaboration of the hormone aldosterone, which, in turn, causes the retention of sodium and water and a reduction in urinary output. In addition, because the movement of intestinal lymph into the liver is blocked by the cirrhotic process in the liver, the backflow of this fluid into the abdominal cavity is greatly increased. A progressive reduction in kidney function that often occurs in

persons with advanced acute or chronic liver disease, hepatorenal syndrome, probably results from an inadequate perfusion of blood through the cortical (outer) portions of the kidneys, where most removal of waste products occurs. With advanced hepatocytic dysfunction, a spasm of blood vessels in the renal cortex can occur, often with good blood flow to the rest of the kidney. This spasm results in progressive failure in kidney function and often leads to death.

[034] Although not uncommon, cancer originating in the liver, usually in hepatocytes and less frequently in cells of bile duct origin, is rare in the West and is almost always associated with active cirrhosis, particularly the form found in patients with chronic hepatitis. The survival rate from liver cancer is small. In certain underdeveloped countries, especially in tribal Africa, the incidence of this malignancy is high and is a major cause of death in the population. Most of these cases appear to stem from the prevalence of chronic viral hepatitis or the chronic presence of viruses in the blood (viremia) caused by hepatitis B. Long exposure to certain environmental poisons, such as vinyl chloride or carbon tetrachloride, has also been shown to lead to hepatic cancer. Cancers arising elsewhere in the body, particularly in abdominal organs, lungs, and lymphoid tissue, commonly lead to metastatic cancer in the liver and are by far the most frequent type of hepatic malignancy. Various benign types of tumors and cysts arise from certain components of the liver, such as the hepatocytes (adenomas) or blood vessels (hemangiomas). While the cause of these lesions is not always clear, hepatic adenomas are associated with the prolonged use of female sex hormones (estrogens). Benign cysts in the liver may occur as congenital defects or as the result of infections from infestation of the dog tapeworm (*Echinococcus granulosus*). Abscesses on the liver result from the spread of infection from the biliary tract or from other parts of the body, especially the appendix and the pelvic organs. Specific liver abscesses also result from infections with the intestinal parasite *Entamoeba histolytica*.

#### *Disorders of the Biliary Tract*

[035] Cholelithiasis, or the formation of gallstones in the gallbladder, is the most common disease of the biliary tract. There are three types of Gallstones: stones containing primarily calcium bilirubinate (pigment stones); stones containing 25 percent or more of cholesterol; and stones composed of variable mixtures of both

bilirubin and cholesterol (mixed gallstones). Pigment stones are the result of an increased amount of bilirubin in the liver (due to hemolytic disease) and the consequent secretion into the biliary tract of increased amounts of the water-soluble conjugate, bilirubin diglucuronide, a pigment that is normally secreted in the urine. In the biliary tract, particularly in the gallbladder, some of this bilirubin diglucuronide is broken down by bacterial or mucosal enzymes into water-insoluble bilirubin, which then tends to form stones. Cholesterol and mixed cholesterol-bilirubinate stones occur when the proportion of cholesterol in bile exceeds the capacity of bile acids and lecithin to contain the total amount of cholesterol in micellar colloidal solution. When this critical micellar concentration is surpassed and the solution is saturated, crystalline particles of cholesterol are formed. The resulting gallstones contain large amounts of crystalline cholesterol and smaller quantities of calcium bilirubinate. Postcholecystectomy syndrome comprises painful attacks, often resembling preoperative symptoms, that occasionally occur following the surgical removal of gallstones and the gallbladder. These attacks may be related to intermittent muscular spasms of the sphincter of Oddi or of the bile ducts.

[036] Cancer of the biliary tract is rare but may occur in almost any area, including the gallbladder, the hepatic ducts, the common bile duct, or the ampulla of Vater. In cancer of the bile duct, congenital cysts and parasitic infections, such as liver flukes, seem to lead to increased risks. Persons with extensive chronic ulcerative colitis also show a greater than normal incidence of bile duct carcinoma.

[037] Jaundice, or yellowing of the skin, scleras, and mucous membranes, occurs whenever the level of bilirubin in the blood is significantly above normal. This condition is evident in three different types of disorders including, unconjugated, or hemolytic, jaundice; hepatocellular jaundice; and cholestatic, or obstructive jaundice. Unconjugated jaundice results when the amount of bilirubin produced from hemoglobin by the destruction of red blood cells or muscle tissue (myoglobin) overwhelms the normal capacity of the liver to transport it or when the ability of the liver to conjugate normal amounts of bilirubin into bilirubin diglucuronide is significantly reduced by inadequate intracellular transport or enzyme systems. Hepatocellular jaundice arises when liver cells are damaged so severely that their ability to transport bilirubin diglucuronide into the biliary system is reduced, allowing

some of this yellow pigment to regurgitate into the bloodstream. Cholestatic jaundice, occurs when essentially normal liver cells are unable to transport bilirubin either through the hepatocytic-bile capillary membrane, because of damage in that area, or through the biliary tract, because of anatomical obstructions (e.g., atresias, gallstones, cancer).

#### *Disorders of the Pancreas*

[038] Inflammation of the pancreas, or pancreatitis, is probably the most common disease of this organ. The disorder may be confined to either singular or repeated acute episodes, or it may become a chronic disease. There are many factors associated with the onset of pancreatitis, including direct injury, certain drugs, viral infections, heredity, hyperlipidemia (increased levels of blood fats), and congenital derangements of the ductal system. Localized, severe abdominal and midback pain resulting from enzyme leakage, tissue damage, and nerve irritation is the most common symptom of acute pancreatitis. In severe cases, respiratory failure, shock, and even death may occur. Chronic pancreatitis rarely follows repeated acute attacks. It seems instead to be a separate disorder that results in mucus plugs and precipitation of calcium salts in the smaller pancreatic ducts. Cystic fibrosis is inherited, but it is not expressed unless both members of a pair of homologous, or corresponding, chromosomes carry the trait. The major functional abnormality in persons with the disease appears to be the elaboration by mucous glands throughout the body of secretions containing greater than normal concentrations of protein and calcium. This imbalance leads to increased viscosity of the secretions and precipitation of mucus and organic constituents in gland ducts. The resulting plugging process in the pancreas almost invariably causes destruction and scarring of the acinar tissue, usually without damaging the islets of Langerhans. A similar process in the hepatic biliary system produces foci of fibrosis and bile duct proliferation, a singular form of cirrhosis.

[039] The discovery of new human digestive system associated polynucleotides, the polypeptides encoded by them, and antibodies that immunospecifically bind these polypeptides, satisfies a need in the art by providing new compositions which are useful in the diagnosis, treatment, prevention and/or prognosis of disorders of the digestive system, including, but not limited to, dysphagia, odynophagia, congenital

disorders of the esophagus, gastric reflux, diverticula, Mallory-Weiss lesions, leiomyomas of the esophagus, lipoma, anorexia, nausea, ulcerative disease, pyloric stenosis, gastroenteritis, gastritis, gastric atrophy, gastric cancer, benign tumors of the duodenum (e.g., polyps and carcinoids), pancreatic cancer, cancer of the bile duct, distension, irritable bowel syndrome, malabsorption, congenital disorders of the small intestine (e.g., Meckel's diverticulum, multiple diverticula), bacterial and parasitic infection (e.g., traveler's diarrhea, typhoid, paratyphoid, cholera, roundworms, tapeworms, amoebae, hookworms, strongyloides, threadworms, and blood flukes), megacolon (e.g., Hirschsprung's disease, aganglionic megacolon, acquired megacolon), colitis (e.g., due to bacterial, fungal, or parasitic infection, ulcerative colitis), tumors of the colon (e.g., polyps or cancers), anorectal disorders (e.g., anal fistulas, hemorrhoids, hepatitis (e.g., acute, chronic, persistent hepatitis, viral (for example, hepatitis caused by hepatitis virus A (HAV), hepatitis virus B (HBV), and hepatitis virus non-A, non-B (NANB) infection), congenital disorders of the liver (e.g., Wilson's disease, hemochromatosis, cystic fibrosis, biliary atresia, and alpha-1-antitrypsin deficiency), cirrhosis, portal hypertension, cholelithiasis, cancer of the biliary tract, jaundice (e.g., unconjugated, hemolytic, hepatocellular, cholestatic, or obstructive jaundice).

### *Summary of the Invention*

[040] The present invention relates to novel digestive system related polynucleotides, the polypeptides encoded by these polynucleotides herein collectively referred to as "digestive system antigens," and antibodies that immunospecifically bind these polypeptides, and the use of such digestive system polynucleotides, antigens, and antibodies for detecting, treating, preventing and/or prognosing disorders of the digestive system, including, but not limited to, the presence of cancer and cancer metastases. More specifically, isolated digestive system nucleic acid molecules are provided encoding novel digestive system polypeptides. Novel digestive system polypeptides and antibodies that bind to these polypeptides are provided. Also provided are vectors, host cells, and recombinant and synthetic methods for producing human digestive system polynucleotides, polypeptides, and/or antibodies. The



invention further relates to diagnostic and therapeutic methods useful for diagnosing, treating, preventing and/or prognosing disorders related to the digestive system, including cancer, and therapeutic methods for treating such disorders. The invention further relates to screening methods for identifying agonists and antagonists of polynucleotides and polypeptides of the invention. The invention further relates to methods and/or compositions for inhibiting or promoting the production and/or function of the polypeptides of the invention.

### *Detailed Description*

#### Tables

[041] Table 1A summarizes some of the polynucleotides encompassed by the invention (including cDNA clones related to the sequences (Clone ID NO:Z), contig sequences (contig identifier (Contig ID:) and contig nucleotide sequence identifier (SEQ ID NO:X)) and further summarizes certain characteristics of these polynucleotides and the polypeptides encoded thereby. The first column provides a unique clone identifier, "Clone ID NO:Z", for a cDNA plasmid related to each digestive system associated contig sequence disclosed in Table 1A. The second column provides a unique contig identifier, "Contig ID:" for each of the contig sequences disclosed in Table 1A. The third column provides the sequence identifier, "SEQ ID NO:X", for each of the contig polynucleotide sequences disclosed in Table 1A. The fourth column, "ORF (From-To)", provides the location (i.e., nucleotide position numbers) within the polynucleotide sequence of SEQ ID NO:X that delineate the preferred open reading frame (ORF) shown in the sequence listing and referenced in Table 1A as SEQ ID NO:Y (column 5). Column 6 lists residues comprising predicted epitopes contained in the polypeptides encoded by each of the preferred ORFs (SEQ ID NO:Y). Identification of potential immunogenic regions was performed according to the method of Jameson and Wolf (CABIOS, 4:181-186 (1988)); specifically, the Genetics Computer Group (GCG) implementation of this algorithm, embodied in the program PEPTIDESTRUCTURE (Wisconsin Package v10.0, Genetics Computer Group (GCG), Madison, Wisc.). This method returns a measure of the probability that a given residue is found on the surface of the protein. Regions where the antigenic index score is greater than 0.9 over at least 6 amino acids

are indicated in Table 1A as "Predicted Epitopes." In particular embodiments, digestive system associated polypeptides of the invention comprise, or alternatively consist of, one, two, three, four, five or more of the predicted epitopes described in Table 1A. It will be appreciated that depending on the analytical criteria used to predict antigenic determinants, the exact address of the determinant may vary slightly. Column 7, "Tissue Distribution" shows the expression profile of tissue, cells, and/or cell line libraries which express the polynucleotides of the invention. The first number in column 7 (preceding the colon), represents the tissue/cell source identifier code corresponding to the code and description provided in Table 4. Expression of these polynucleotides was not observed in the other tissues and/or cell libraries tested. For those identifier codes in which the first two letters are not "AR", the second number in column 7 (following the colon) represents the number of times a sequence corresponding to the reference polynucleotide sequence (e.g., SEQ ID NO:X) was identified in the tissue/cell source. Those tissue/cell source identifier codes in which the first two letters are "AR" designate information generated using DNA array technology. Utilizing this technology, cDNAs were amplified by PCR and then transferred, in duplicate, onto the array. Gene expression was assayed through hybridization of first strand cDNA probes to the DNA array. cDNA probes were generated from total RNA extracted from a variety of different tissues and cell lines. Probe synthesis was performed in the presence of <sup>33</sup>P dCTP, using oligo(dT) to prime reverse transcription. After hybridization, high stringency washing conditions were employed to remove non-specific hybrids from the array. The remaining signal, emanating from each gene target, was measured using a Phosphorimager. Gene expression was reported as Phosphor Stimulating Luminescence (PSL) which reflects the level of phosphor signal generated from the probe hybridized to each of the gene targets represented on the array. A local background signal subtraction was performed before the total signal generated from each array was used to normalize gene expression between the different hybridizations. The value presented after "[array code]." represents the mean of the duplicate values, following background subtraction and probe normalization. One of skill in the art could routinely use this information to identify normal and/or diseased tissue(s) which show a predominant expression pattern of the corresponding polynucleotide of the invention or to identify polynucleotides

which show predominant and/or specific tissue and/or cell expression. Column 8, "Cytologic Band," provides the chromosomal location of polynucleotides corresponding to SEQ ID NO:X. Chromosomal location was determined by finding exact matches to EST and cDNA sequences contained in the NCBI (National Center for Biotechnology Information) UniGene database. Given a presumptive chromosomal location, disease locus association was determined by comparison with the Morbid Map, derived from Online Mendelian Inheritance in Man (Online Mendelian Inheritance in Man, OMIM™. McKusick-Nathans Institute for Genetic Medicine, Johns Hopkins University (Baltimore, MD) and National Center for Biotechnology Information, National Library of Medicine (Bethesda, MD) 2000. World Wide Web URL: <http://www.ncbi.nlm.nih.gov/omim/>). If the putative chromosomal location of the Query overlapped with the chromosomal location of a Morbid Map entry, an OMIM identification number is provided in Table 1A, column 9 labeled "OMIM Disease Reference(s)". A key to the OMIM reference identification numbers is provided in Table 5.

[042] Table 1B summarizes additional polynucleotides encompassed by the invention (including cDNA clones related to the sequences (Clone ID NO:Z), contig sequences (contig identifier (Contig ID:) contig nucleotide sequence identifiers (SEQ ID NO:X)), and genomic sequences (SEQ ID NO:B). The first column provides a unique clone identifier, "Clone ID NO:Z", for a cDNA clone related to each contig sequence. The second column provides the sequence identifier, "SEQ ID NO:X", for each contig sequence. The third column provides a unique contig identifier, "Contig ID:" for each contig sequence. The fourth column, provides a BAC identifier "BAC ID NO:A" for the BAC clone referenced in the corresponding row of the table. The fifth column provides the nucleotide sequence identifier, "SEQ ID NO:B" for a fragment of the BAC clone identified in column four of the corresponding row of the table. The sixth column, "Exon From-To", provides the location (i.e., nucleotide position numbers) within the polynucleotide sequence of SEQ ID NO:B which delineate certain polynucleotides of the invention that are also exemplary members of polynucleotide sequences that encode polypeptides of the invention (e.g., polypeptides containing amino acid sequences encoded by the polynucleotide sequences delineated in column six, and fragments and variants thereof).

[043] Table 2 summarizes homology and features of some of the polypeptides of the invention. The first column provides a unique clone identifier, "Clone ID NO:Z", corresponding to a cDNA disclosed in Table 1A. The second column provides the unique contig identifier, "Contig ID:" corresponding to contigs in Table 1A and allowing for correlation with the information in Table 1A. The third column provides the sequence identifier, "SEQ ID NO:X", for the contig polynucleotide sequences. The fourth column provides the analysis method by which the homology/identity disclosed in the row was determined. Comparisons were made between polypeptides encoded by the polynucleotides of the invention and either a non-redundant protein database (herein referred to as "NR"), or a database of protein families (herein referred to as "PFAM") as further described below. The fifth column provides a description of PFAM/NR hits having significant matches to a polypeptide of the invention. Column six provides the accession number of the PFAM/NR hit disclosed in the fifth column. Column seven, "Score/Percent Identity", provides a quality score or the percent identity, of the hit disclosed in column five. Columns 8 and 9, "NT From" and "NT To" respectively, delineate the polynucleotides in "SEQ ID NO:X" that encode a polypeptide having a significant match to the PFAM/NR database as disclosed in the fifth column. In specific embodiments, polypeptides of the invention comprise, or alternatively consist of, an amino acid sequence encoded by the polynucleotides in SEQ ID NO:X as delineated in columns 8 and 9, or fragments or variants thereof.

[044] Table 3 provides polynucleotide sequences that may be disclaimed according to certain embodiments of the invention. The first column provides a unique clone identifier, "Clone ID NO:Z", for a cDNA clone related to digestive system associated contig sequences disclosed in Table 1A. The second column provides the sequence identifier, "SEQ ID NO:X", for contig polynucleotide sequences disclosed in Table 1A. The third column provides the unique contig identifier, "Contig ID", for contigs disclosed in Table 1A. The fourth column provides a unique integer 'a' where 'a' is any integer between 1 and the final nucleotide minus 15 of SEQ ID NO:X, represented as "Range of a", and the fifth column provides a unique integer 'b' where 'b' is any integer between 15 and the final nucleotide of SEQ ID NO:X, represented as "Range of b", where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:X, and where b is greater than or equal to a + 14. For each of the

polynucleotides shown as SEQ ID NO:X, the uniquely defined integers can be substituted into the general formula of a-b, and used to describe polynucleotides which may be preferably excluded from the invention. In certain embodiments, preferably excluded from the polynucleotides of the invention (including polynucleotide fragments and variants as described herein and diagnostic and/or therapeutic uses based on these polynucleotides) are at least one, two, three, four, five, ten, or more of the polynucleotide sequence(s) having the accession number(s) disclosed in the sixth column of this Table (including for example, published sequence in connection with a particular BAC clone). In further embodiments, preferably excluded from the invention are the specific polynucleotide sequence(s) contained in the clones corresponding to at least one, two, three, four, five, ten, or more of the available material having the accession numbers identified in the sixth column of this Table (including for example, the actual sequence contained in an identified BAC clone).

[045] Table 4 provides a key to the tissue/cell source identifier code disclosed in Table 1A, column 7. Column 1 provides the key to the tissue/cell source identifier code disclosed in Table 1A, Column 7. Columns 2-5 provide a description of the tissue or cell source. Codes corresponding to diseased tissues are indicated in column 6 with the word "disease". The use of the word "disease" in column 6 is non-limiting. The tissue or cell source may be specific (e.g. a neoplasm), or may be disease-associated (e.g., a tissue sample from a normal portion of a diseased organ). Furthermore, tissues and/or cells lacking the "disease" designation may still be derived from sources directly or indirectly involved in a disease state or disorder, and therefore may have a further utility in that disease state or disorder. In numerous cases where the tissue/cell source is a library, column 7 identifies the vector used to generate the library.

[046] Table 5 provides a key to the OMIM™ reference identification numbers disclosed in Table 1A, column 9. OMIM reference identification numbers (Column 1) were derived from Online Mendelian Inheritance in Man (Online Mendelian Inheritance in Man, OMIM™. McKusick-Nathans Institute for Genetic Medicine, Johns Hopkins University (Baltimore, MD) and National Center for Biotechnology Information, National Library of Medicine, (Bethesda, MD) 2000. World Wide Web URL: <http://www.ncbi.nlm.nih.gov/omim/>). Column 2 provides diseases associated with the cytologic band disclosed in Table 1A, column 8, as determined from the Morbid Map

database.

[047] Table 6 summarizes ATCC Deposits, Deposit dates, and ATCC designation numbers of deposits made with the ATCC in connection with the present application.

[048] Table 7 shows the cDNA libraries sequenced, tissue source description, vector information and ATCC designation numbers relating to these cDNA libraries.

[049] Table 8 provides a physical characterization of clones encompassed by the invention. The first column provides the unique clone identifier, "Clone ID NO:Z", for certain cDNA clones of the invention, as described in Table 1A. The second column provides the size of the cDNA insert contained in the corresponding cDNA clone.

### **Definitions**

[050] The following definitions are provided to facilitate understanding of certain terms used throughout this specification.

[051] In the present invention, "isolated" refers to material removed from its original environment (e.g., the natural environment if it is naturally occurring), and thus is altered "by the hand of man" from its natural state. For example, an isolated polynucleotide could be part of a vector or a composition of matter, or could be contained within a cell, and still be "isolated" because that vector, composition of matter, or particular cell is not the original environment of the polynucleotide. The term "isolated" does not refer to genomic or cDNA libraries, whole cell total or mRNA preparations, genomic DNA preparations (including those separated by electrophoresis and transferred onto blots), sheared whole cell genomic DNA preparations or other compositions where the art demonstrates no distinguishing features of the polynucleotide sequences of the present invention.

[052] As used herein, a "polynucleotide" refers to a molecule having a nucleic acid sequence encoding SEQ ID NO:Y or a fragment or variant thereof, a nucleic acid sequence contained in SEQ ID NO:X (as described in column 3 of Table 1A) or the complement thereof, a cDNA sequence contained in Clone ID NO:Z (as described in column 1 of Table 1A and contained within a library deposited with the ATCC); a nucleotide sequence encoding the polypeptide encoded by a nucleotide sequence in SEQ ID NO:B as defined in column 6 of Table 1B or a fragment or variant thereof; or



a nucleotide coding sequence in SEQ ID NO:B as defined in column 6 of Table 1B or the complement thereof. For example, the polynucleotide can contain the nucleotide sequence of the full length cDNA sequence, including the 5' and 3' untranslated sequences, the coding region, as well as fragments, epitopes, domains, and variants of the nucleic acid sequence. Moreover, as used herein, a "polypeptide" refers to a molecule having an amino acid sequence encoded by a polynucleotide of the invention as broadly defined (obviously excluding poly-Phenylalanine or poly-Lysine peptide sequences which result from translation of a polyA tail of a sequence corresponding to a cDNA).

[053] As used herein, a "digestive system antigen" refers collectively to any polynucleotide disclosed herein (e.g., a nucleic acid sequence contained in SEQ ID NO:X or the complement thereof, or cDNA sequence contained in Clone ID NO:Z, or a nucleotide sequence encoding the polypeptide encoded by a nucleotide sequence in SEQ ID NO:B as defined in column 6 of Table 1B, or a nucleotide coding sequence in SEQ ID NO:B as defined in column 6 of Table 1B or the complement thereof and fragments or variants thereof as described herein) or any polypeptide disclosed herein (e.g., an amino acid sequence contained in SEQ ID NO:Y, an amino acid sequence encoded by SEQ ID NO:X, or the complement thereof, an amino acid sequence encoded by the cDNA sequence contained in Clone ID NO:Z, an amino acid sequence encoded by SEQ ID NO:B, or the complement thereof, and fragments or variants thereof as described herein). These digestive system antigens have been determined to be predominantly expressed in digestive system tissues, including normal or diseased tissues (as shown in Table 1A column 7 and Table 4).

[054] In the present invention, "SEQ ID NO:X" was often generated by overlapping sequences contained in multiple clones (contig analysis). A representative clone containing all or most of the sequence for SEQ ID NO:X is deposited at Human Genome Sciences, Inc. (HGS) in a catalogued and archived library. As shown, for example, in column 1 of Table 1A, each clone is identified by a cDNA Clone ID (identifier generally referred to herein as Clone ID NO:Z). Each Clone ID is unique to an individual clone and the Clone ID is all the information needed to retrieve a given clone from the HGS library. Furthermore, certain clones disclosed in this application have been deposited with the ATCC on October 5, 2000, having the ATCC

designation numbers PTA 2574 and PTA 2575; and on January 5, 2001, having the depositor reference numbers TS-1, TS-2, AC-1, and AC-2. In addition to the individual cDNA clone deposits, most of the cDNA libraries from which the clones were derived were deposited at the American Type Culture Collection (hereinafter "ATCC"). Table 7 provides a list of the deposited cDNA libraries. One can use the Clone ID NO:Z to determine the library source by reference to Tables 6 and 7. Table 7 lists the deposited cDNA libraries by name and links each library to an ATCC Deposit. Library names contain four characters, for example, "HTWE." The name of a cDNA clone (Clone ID NO:Z) isolated from that library begins with the same four characters, for example "HTWEP07". As mentioned below, Table 1A correlates the Clone ID NO:Z names with SEQ ID NO:X. Thus, starting with an SEQ ID NO:X, one can use Tables 1A, 6 and 7 to determine the corresponding Clone ID NO:Z, which library it came from and which ATCC deposit the library is contained in. Furthermore, it is possible to retrieve a given cDNA clone from the source library by techniques known in the art and described elsewhere herein. The ATCC is located at 10801 University Boulevard, Manassas, Virginia 20110-2209, USA. The ATCC deposits were made pursuant to the terms of the Budapest Treaty on the international recognition of the deposit of microorganisms for the purposes of patent procedure.

[055] In specific embodiments, the polynucleotides of the invention are at least 15, at least 30, at least 50, at least 100, at least 125, at least 500, or at least 1000 continuous nucleotides but are less than or equal to 300 kb, 200 kb, 100 kb, 50 kb, 15 kb, 10 kb, 7.5 kb, 5 kb, 2.5 kb, 2.0 kb, or 1 kb, in length. In a further embodiment, polynucleotides of the invention comprise a portion of the coding sequences, as disclosed herein, but do not comprise all or a portion of any intron. In another embodiment, the polynucleotides comprising coding sequences do not contain coding sequences of a genomic flanking gene (i.e., 5' or 3' to the gene of interest in the genome). In other embodiments, the polynucleotides of the invention do not contain the coding sequence of more than 1000, 500, 250, 100, 50, 25, 20, 15, 10, 5, 4, 3, 2, or 1 genomic flanking gene(s).

[056] A "polynucleotide" of the present invention also includes those polynucleotides capable of hybridizing, under stringent hybridization conditions, to sequences contained in SEQ ID NO:X, or the complement thereof (e.g., the complement of any

one, two, three, four, or more of the polynucleotide fragments described herein), the polynucleotide sequence delineated in columns 8 and 9 of Table 2 or the complement thereof, and/or cDNA sequences contained in Clone ID NO:Z (e.g., the complement of any one, two, three, four, or more of the polynucleotide fragments, or the cDNA clone within the pool of cDNA clones deposited with the ATCC, described herein) and/or the polynucleotide sequence delineated in column 6 of Table 1B or the complement thereof. "Stringent hybridization conditions" refers to an overnight incubation at 42 degree C in a solution comprising 50% formamide, 5x SSC (750 mM NaCl, 75 mM trisodium citrate), 50 mM sodium phosphate (pH 7.6), 5x Denhardt's solution, 10% dextran sulfate, and 20 µg/ml denatured, sheared salmon sperm DNA, followed by washing the filters in 0.1x SSC at about 65 degree C.

[057] Also contemplated are nucleic acid molecules that hybridize to the polynucleotides of the present invention at lower stringency hybridization conditions. Changes in the stringency of hybridization and signal detection are primarily accomplished through the manipulation of formamide concentration (lower percentages of formamide result in lowered stringency), salt conditions, or temperature. For example, lower stringency conditions include an overnight incubation at 37 degree C in a solution comprising 6X SSPE (20X SSPE = 3M NaCl; 0.2M  $\text{NaH}_2\text{PO}_4$ ; 0.02M EDTA, pH 7.4), 0.5% SDS, 30% formamide, 100 µg/ml salmon sperm blocking DNA; followed by washes at 50 degree C with 1XSSPE, 0.1% SDS. In addition, to achieve even lower stringency, washes performed following stringent hybridization can be done at higher salt concentrations (e.g. 5X SSC).

[058] Note that variations in the above conditions may be accomplished through the inclusion and/or substitution of alternate blocking reagents used to suppress background in hybridization experiments. Typical blocking reagents include Denhardt's reagent, BLOTTO, heparin, denatured salmon sperm DNA, and commercially available proprietary formulations. The inclusion of specific blocking reagents may require modification of the hybridization conditions described above, due to problems with compatibility.

[059] Of course, a polynucleotide which hybridizes only to polyA+ sequences (such as any 3' terminal polyA+ tract of a cDNA shown in the sequence listing), or to a complementary stretch of T (or U) residues, would not be included in the definition of

"polynucleotide," since such a polynucleotide would hybridize to any nucleic acid molecule containing a poly (A) stretch or the complement thereof (e.g., practically any double-stranded cDNA clone generated using oligo dT as a primer).

[060] The polynucleotide of the present invention can be composed of any polyribonucleotide or polydeoxribonucleotide, which may be unmodified RNA or DNA or modified RNA or DNA. For example, polynucleotides can be composed of single- and double-stranded DNA, DNA that is a mixture of single- and double-stranded regions, single- and double-stranded RNA, and RNA that is mixture of single- and double-stranded regions, hybrid molecules comprising DNA and RNA that may be single-stranded or, more typically, double-stranded or a mixture of single- and double-stranded regions. In addition, the polynucleotide can be composed of triple-stranded regions comprising RNA or DNA or both RNA and DNA. A polynucleotide may also contain one or more modified bases or DNA or RNA backbones modified for stability or for other reasons. "Modified" bases include, for example, tritylated bases and unusual bases such as inosine. A variety of modifications can be made to DNA and RNA; thus, "polynucleotide" embraces chemically, enzymatically, or metabolically modified forms.

[061] The polypeptide of the present invention can be composed of amino acids joined to each other by peptide bonds or modified peptide bonds, i.e., peptide isosteres, and may contain amino acids other than the 20 gene-encoded amino acids. The polypeptides may be modified by either natural processes, such as posttranslational processing, or by chemical modification techniques which are well known in the art. Such modifications are well described in basic texts and in more detailed monographs, as well as in a voluminous research literature. Modifications can occur anywhere in a polypeptide, including the peptide backbone, the amino acid side-chains and the amino or carboxyl termini. It will be appreciated that the same type of modification may be present in the same or varying degrees at several sites in a given polypeptide. Also, a given polypeptide may contain many types of modifications. Polypeptides may be branched, for example, as a result of ubiquitination, and they may be cyclic, with or without branching. Cyclic, branched, and branched cyclic polypeptides may result from posttranslation natural processes or may be made by synthetic methods. Modifications include acetylation, acylation, ADP-ribosylation, amidation, covalent

attachment of flavin, covalent attachment of a heme moiety, covalent attachment of a nucleotide or nucleotide derivative, covalent attachment of a lipid or lipid derivative, covalent attachment of phosphatidylinositol, cross-linking, cyclization, disulfide bond formation, demethylation, formation of covalent cross-links, formation of cysteine, formation of pyroglutamate, formylation, gamma-carboxylation, glycosylation, GPI anchor formation, hydroxylation, iodination, methylation, myristoylation, oxidation, pegylation, proteolytic processing, phosphorylation, prenylation, racemization, selenoylation, sulfation, transfer-RNA mediated addition of amino acids to proteins such as arginylation, and ubiquitination. (See, for instance, PROTEINS - STRUCTURE AND MOLECULAR PROPERTIES, 2nd Ed., T. E. Creighton, W. H. Freeman and Company, New York (1993); POSTTRANSLATIONAL COVALENT MODIFICATION OF PROTEINS, B. C. Johnson, Ed., Academic Press, New York, pgs. 1-12 (1983); Seifter et al., Meth. Enzymol. 182:626-646 (1990); Rattan et al., Ann. N.Y. Acad. Sci. 663:48-62 (1992).)

[062] "SEQ ID NO:X" refers to a polynucleotide sequence described, for example, in Tables 1A or 2, while "SEQ ID NO:Y" refers to a polypeptide sequence described in column 5 of Table 1A. SEQ ID NO:X is identified by an integer specified in column 3 of Table 1A. The polypeptide sequence SEQ ID NO:Y is a translated open reading frame (ORF) encoded by polynucleotide SEQ ID NO:X. "Clone ID NO:Z" refers to a cDNA clone described in column 1 of Table 1A.

[063] "A polypeptide having biological activity" refers to a polypeptide exhibiting activity similar to, but not necessarily identical to, an activity of a polypeptide of the present invention, including mature forms, as measured in a particular biological assay, with or without dose dependency. In the case where dose dependency does exist, it need not be identical to that of the polypeptide, but rather substantially similar to the dose-dependence in a given activity as compared to the polypeptide of the present invention (i.e., the candidate polypeptide will exhibit greater activity or not more than about 25-fold less and, preferably, not more than about tenfold less activity, and most preferably, not more than about three-fold less activity relative to the polypeptide of the present invention).

[064] Table 1A summarizes some of the digestive system associated polynucleotides encompassed by the invention (including contig sequences (SEQ ID NO:X) and

clones (Clone ID NO:Z) and further summarizes certain characteristics of these polynucleotides and the polypeptides encoded thereby.

**Polynucleotides and Polypeptides**

**TABLE 1A**

| Clone ID<br>NO: Z | Contig<br>ID: | SEQ ID<br>NO: X | ORF<br>(From-To) | AA<br>SEQ<br>ID<br>NO: Y | Predicted Epitopes   | Tissue<br>Distribution<br>Library code:<br>count<br>(see Table IV for<br>Library Codes) | Cytologic<br>Band | OMIM<br>Disease<br>Reference(s):   |
|-------------------|---------------|-----------------|------------------|--------------------------|--|---|-------------------|--|
| H2CBG54           | 893910        | 11              | 3 - 641          | 1271                     | Ser-18 to Val-29,<br>His-45 to Leu-51,<br>Pro-86 to Lys-102,<br>Glu-123 to Tyr-129,<br>Leu-156 to Cys-161. | L0005: 1, T0110:<br>1, H0039: 1 and<br>L0596: 1.  |                   |  |
| H2MBV93           | 686344        | 12              | 98 - 352         | 1272                     | Arg-1 to Ser-6.  | T0109: 1 and<br>H0539: 1.   |                   |  |
| HALSC22           | 503082        | 13              | 67 - 336         | 1273                     |  | H0098: 2  |                   |  |
| HALSE71           | 509638        | 14              | 53 - 145         | 1274                     |  | H0098: 2  |                   |  |
| HALSG01           | 500834        | 15              | 110 - 256        | 1275                     | Leu-8 to Tyr-15,<br>Gly-24 to Thr-29.  | H0098: 2  |                   |  |
| HALSH86           | 501004        | 16              | 3 - 104          | 1276                     |  | H0098: 2  |                   |  |
| HALSJ15           | 501008        | 17              | 167 - 268        | 1277                     |  | H0098: 2  |                   |  |
| HALSK15           | 501003        | 18              | 442 - 579        | 1278                     | Lys-11 to Arg-21.  | H0574: 3, L0748:<br>2, H0098: 1 and<br>H0014: 1.  | 6p21.3            | 106300,<br>108800,<br>120290,<br>120290,<br>120810,<br>120820,<br>142857,<br>142858,<br>150270,<br>167250, |

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|         |        |    |           |      |  |   | 170261,<br>177900,<br>179450,<br>201910,<br>217000,<br>222100,<br>233100,<br>235200,<br>248611,<br>256550,<br>256550,<br>600202,<br>600261,<br>601868,<br>602280,<br>602475 |
| HALSL45 | 723542 | 19 | 220 - 396 | 1279 | Leu-24 to Thr-29,<br>Thr-47 to Tyr-56. | L0756: 3, L0517:<br>2, H0098: 1,<br>H0510: 1 and<br>L0731: 1. |   |
| HALSN27 | 509759 | 20 | 145 - 318 | 1280 | Lys-1 to Ser-6,<br>Trp-35 to Asp-47.   | H0098: 2  |   |
| HALSN49 | 971590 | 21 | 1 - 75    | 1281 |  | H0098: 2  |   |
| HBAAE56 | 953244 | 22 | 1 - 165   | 1282 |  | S0356: 1, S0410: 1<br>and S0404: 1.                           |   |
| HBAAF58 | 861603 | 23 | 237 - 425 | 1283 | Asp-8 to Leu-16.                       | S0404: 2  |   |
| HCLHD88 | 929223 | 24 | 1 - 339   | 1284 | Ser-9 to Trp-18,<br>Pro-33 to Arg-44.  | H0676: 2  |   |
| HCNAC10 | 968738 | 25 | 15 - 167  | 1285 |  | H0085: 2  |   |



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| HCNAG07 | 954493 | 26 | 2 - 157   | 1286 |   | H0085: 2 and<br>H0597: 1.                        |  |  |
| HCNAK56 | 832249 | 27 | 1 - 99    | 1287 |   | H0085: 1 and<br>H0231: 1.                        |  |  |
| HCNAL66 | 832247 | 28 | 437 - 180 | 1288 |   | H0085: 1, H0597:<br>1, L0775: 1 and<br>L0748: 1. |  |  |
| HCNAN69 | 655816 | 29 | 1 - 318   | 1289 | Pro-28 to Arg-34,<br>Cys-40 to Arg-45,<br>Pro-49 to Asp-56. | H0085: 2   |  |  |
| HCNAO20 | 832251 | 30 | 69 - 314  | 1290 | Phe-24 to Thr-36,<br>Pro-60 to Thr-70.                      | H0085: 2, L0748:<br>2 and H0597: 1.              |  |  |
| HCNAR21 | 948746 | 31 | 68 - 154  | 1291 | Arg-1 to Ile-6.   | H0085: 2   |  |  |
| HCNAX26 | 832250 | 32 | 64 - 216  | 1292 | Arg-23 to Ser-30.   | H0085: 1 and<br>H0597: 1.                        |  |  |
| HCNCF73 | 762056 | 33 | 13 - 291  | 1293 | Tyr-54 to Lys-59.   | H0597: 2   |  |  |
| HCNCH64 | 922009 | 34 | 3 - 311   | 1294 |   | H0597: 2   |  |  |
| HCNCN84 | 766990 | 35 | 1 - 270   | 1295 | Pro-59 to Pro-66.   | H0597: 2   |  |  |
| HCNCQ46 | 832349 | 36 | 1 - 183   | 1296 | Pro-5 to Gly-13,<br>Gly-31 to Gly-38,<br>Pro-46 to Lys-57.  | H0597: 2 and<br>H0595: 1.                        |  |  |
| HCNCQ79 | 832242 | 37 | 118 - 2   | 1297 |   | H0085: 1 and<br>H0597: 1.                        |  |  |
| HCNCQ81 | 887923 | 38 | 3 - 131   | 1298 |   | H0574: 1 and<br>H0597: 1.                        |  |  |
| HCNCU02 | 918993 | 39 | 2 - 265   | 1299 | Arg-1 to Lys-14,<br>Arg-19 to Pro-27.                       | H0597: 2   |  |  |
| HCNCU83 | 731739 | 40 | 350 - 496 | 1300 |   | H0597: 1 and                                     |  |  |

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| HCNCV19 | 832221 | 41 | 59 - 193  | 1301 | Lys-14 to Ile-19. | H0510: 1.                           |  |  |
| HCNCY39 | 960373 | 42 | 2 - 151   | 1302 | Thr-1 to Asn-10.  | H0085: 1 and<br>H0597: 1.           |  |  |
| HCNDB53 | 832225 | 43 | 7 - 177   | 1303 | Gly-26 to Gln-31. | H0597: 1 and<br>H0231: 1.           |  |  |
| HCNDD83 | 832230 | 44 | 116 - 271 | 1304 |                   | H0085: 1 and<br>H0597: 1.           |  |  |
| HCNDF20 | 669111 | 45 | 258 - 46  | 1305 |                   | H0597: 1 and<br>H0231: 1.           |  |  |
| HCNDG69 | 666726 | 46 | 134 - 295 | 1306 |                   | H0597: 2                            |  |  |
| HCNDH18 | 832215 | 47 | 2 - 202   | 1307 |                   | H0597: 2                            |  |  |
| HCNDI01 | 832213 | 48 | 116 - 286 | 1308 |                   | H0085: 1 and<br>H0597: 1.           |  |  |
| HCNDK62 | 742883 | 49 | 17 - 412  | 1309 |                   | H0085: 1 and<br>H0597: 1.           |  |  |
| HCNDL91 | 832209 | 50 | 54 - 260  | 1310 |                   | H0014: 1.                           |  |  |
| HCNDN43 | 832212 | 51 | 85 - 291  | 1311 |                   | S0358: 1 and<br>H0597: 1.           |  |  |
| HCNDQ50 | 723976 | 52 | 106 - 234 | 1312 |                   | H0597: 1 and<br>H0231: 1.           |  |  |
| HCNDV42 | 927262 | 53 | 26 - 151  | 1313 |                   | H0597: 2                            |  |  |
| HCNSM15 | 914484 | 54 | 2 - 289   | 1314 | Pro-39 to Ser-47. | H0597: 2                            |  |  |
| HCNSP37 | 655829 | 55 | 120 - 260 | 1315 | Leu-12 to His-23. | S0354: 1, H0231:<br>1 and L0740: 1. |  |  |
| HCNSQ03 | 832200 | 56 | 53 - 205  | 1316 | Lys-33 to Pro-41. | H0231: 2                            |  |  |
|         |        |    |           |      |                   | S0354: 1 and<br>H0231: 1.           |  |  |

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|-----------|--------|----|------------|------|--|---|--------|---|
| HCNUA60   | 695786 | 57 | 15 - 245   | 1317 | Arg-5 to Arg-15.   | AR089: 4, AR061:<br>2<br>H0232: 2   |        |   |
| HCNUA84   | 522523 | 58 | 3 - 194    | 1318 |  | H0232: 2  |        |   |
| HCQAK31   | 915563 | 59 | 998 - 1192 | 1319 | Ser-33 to Pro-44.  | L0770: 3, L0764:<br>3, L0773: 3, H0596:<br>2, L0771: 2, L0805:<br>2, S0360: 1, S0408:<br>1, H0263: 1, S0464:<br>1, L0772: 1, L0646:<br>1, L0375: 1 and<br>L0758: 1. | Xq22   | 300088,<br>300300,<br>300300,<br>301201,<br>301500,<br>301835,<br>303630,<br>303630,<br>303631,<br>304500,<br>304700,<br>304700,<br>304700,<br>309300,<br>309605,<br>311850,<br>312080,<br>312080 |
| HCQCR67   | 974592 | 60 | 1 - 252    | 1320 | Pro-49 to Leu-55.  | H0596: 3  |        |   |
| HCRMCMC26 | 913972 | 61 | 472 - 158  | 1321 | Val-1 to Pro-25.   | S0356: 2 and<br>L0658: 1.   |        |   |
| HCRMJ47   | 919757 | 62 | 112 - 537  | 1322 | Asn-3 to Trp-18,<br>Gly-30 to Ser-35,<br>Pro-41 to Ser-51,<br>Pro-87 to Pro-100, | S0356: 2  | 4p16.3 | 134934,<br>134934,<br>134934,<br>134934,  |

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|          |        |    |                |      |   | Gly-102 to Gly-108.                                  |     |  |  | 134934,<br>143100,<br>180072,<br>180072,<br>194190,<br>252800,<br>252800,<br>252800,<br>600965 |
| HCRMP18  | 888719 | 63 | 3 - 623        | 1323 | Pro-111 to Arg-117,<br>Pro-122 to Glu-130.                  | S0356: 2   |     |  |  |  |
| HCRMRO8  | 958489 | 64 | 349 - 513      | 1324 |   | S0356: 2   |     |  |  |  |
| HCRMRO69 | 877118 | 65 | 2 - 331        | 1325 | Ala-31 to Ser-36,<br>Gln-42 to Gly-49.                      | AR089: 30,<br>AR061: 10<br>S0356: 1 and<br>H0622: 1. |     |  |  |  |
| HCRMT41  | 974324 | 66 | 1 - 630        | 1326 |   | S0356: 3   |     |  |  |  |
| HCRND67  | 921398 | 67 | 2011 -<br>1673 | 1327 |   | S0356: 3   |     |  |  |  |
| HCRNF63  | 916063 | 68 | 201 - 1        | 1328 | Gly-10 to Thr-15.   | S0356: 2 and<br>L0777: 1.                            |     |  |  |  |
| HCRNH81  | 914840 | 69 | 3 - 638        | 1329 |   | S0356: 1 and<br>H0622: 1.                            |     |  |  |  |
| HCRNI04  | 849408 | 70 | 202 - 405      | 1330 | Leu-53 to Gly-58.   | S0356: 3 and<br>L0747: 2.                            |     |  |  |  |
| HCRNK95  | 890458 | 71 | 87 - 242       | 1331 |   | S0356: 2   | 1   |  |  |  |
| HCR0E42  | 950701 | 72 | 3 - 683        | 1332 | Phe-48 to Gly-56,<br>Ile-60 to Glu-65,<br>Pro-73 to Trp-80, | L0805: 2, S0356:<br>1, H0596: 1 and<br>S0350: 1.     | 17q |  |  |  |

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| HCR0M08 | 974135 | 73 | 1 - 204   | 1333 | Ser-100 to Gly-112.  |   |           |  |  |
| HCR0N75 | 922386 | 74 | 3 - 200   | 1334 | Cys-1 to Gly-6.  | S0356: 3  |           |  |  |
| HCR0V23 | 975245 | 75 | 324 - 644 | 1335 | Val-20 to Asn-27.  | S0356: 2  | 4         |  |  |
|         |        |    |           |      | Pro-8 to Glu-17,<br>Arg-24 to Arg-31,<br>Leu-39 to Pro-49,<br>Val-65 to Met-73.  | S0356: 4  |           |  |  |
| HCR0Z66 | 909686 | 76 | 239 - 391 | 1336 | Arg-7 to Lys-13.   | S0356: 2  |           |  |  |
| HCRPT92 | 931152 | 77 | 2 - 907   | 1337 | Pro-40 to Gly-47,<br>Gly-63 to Leu-68,<br>Asn-82 to Asp-87,<br>Asn-101 to Glu-106,<br>Ala-162 to Asp-168,<br>Ser-194 to Ser-204. | AR089: 7, AR061:<br>5<br>S0328: 2 and<br>S0356: 1.  |           |  |  |
| HCRPU05 | 931081 | 78 | 1 - 267   | 1338 | Ser-6 to Phe-19,<br>Thr-31 to Lys-58,<br>Gly-73 to Met-81.   | S0356: 2  |           |  |  |
| HCRPZ11 | 973908 | 79 | 635 - 399 | 1339 |  | S0356: 3  |           |  |  |
| HCRQG35 | 954968 | 80 | 290 - 502 | 1340 | Glu-1 to Tyr-6.  | S0356: 1, S0376: 1<br>and L0752: 1.   |           |  |  |
| HDDAD23 | 967714 | 81 | 2 - 211   | 1341 | Thr-27 to Met-34,<br>Arg-60 to Lys-66.   | H0339: 2  |           |  |  |
| HDDAF44 | 715802 | 82 | 375 - 563 | 1342 |  | L0623: 2, S0360:<br>1, H0339: 1, L0622:<br>1, L0774: 1, L0743:<br>1, L0748: 1, L0754:<br>1, L0747: 1, L0750:<br>1 and L0779: 1. | 16q22-q23 | 103850,<br>114835,<br>121360,<br>217800,<br>218030 |  |

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| HDRMA28 | 841936 | 83 | 47 - 298  | 1343 | Glu-54 to Ala-61,<br>Pro-63 to Ala-82.                    | S0352: 2  |  |  |
| HDRMB41 | 691662 | 84 | 203 - 51  | 1344 | Lys-1 to Asn-6,<br>Pro-12 to Thr-21,<br>Glu-30 to Phe-51. | S0352: 2  |  |  |
| HDRME31 | 697523 | 85 | 225 - 392 | 1345 |   | S0352: 2  |  |  |
| HDRMF01 | 915726 | 86 | 1 - 129   | 1346 | Leu-24 to Asp-31.   | H0014: 1 and<br>S0352: 1.   |  |  |
| HEPND10 | 963559 | 87 | 368 - 625 | 1347 | His-4 to Leu-9,<br>Tyr-24 to Asp-29,<br>Arg-58 to Arg-65. | S0430: 2  |  |  |
| HFLNA59 | 537447 | 88 | 101 - 319 | 1348 | Pro-23 to Ala-30.   | H0357: 2  |  |  |
| HFLQA82 | 757380 | 89 | 1 - 138   | 1349 |   | H0357: 2  |  |  |
| HFLQF55 | 719018 | 90 | 3 - 230   | 1350 |   | H0357: 1, L0157:<br>1, H0510: 1, L0438:<br>1, L0748: 1 and<br>L0439: 1. |  |  |
| HFLSF55 | 955305 | 91 | 221 - 385 | 1351 | Pro-1 to Asn-6.   | H0197: 3, H0199:<br>1 and H0246: 1.                                     |  |  |
| HFLSH67 | 968639 | 92 | 55 - 192  | 1352 | Asp-31 to Gly-41.   | H0197: 6, H0199:<br>2 and L0748: 1.                                     |  |  |
| HFLSI23 | 509743 | 93 | 282 - 416 | 1353 | Pro-6 to Asp-11.  | H0197: 2 and<br>L0748: 1.   |  |  |
| HFLSJ61 | 507017 | 94 | 91 - 318  | 1354 |   | H0197: 2 and<br>H0199: 1.   |  |  |
| HFLSK11 | 964908 | 95 | 3 - 335   | 1355 | Pro-5 to Ala-12.  | H0197: 1, H0199:<br>1 and H0198: 1.                                     |  |  |
| HFLSK31 | 535238 | 96 | 207 - 329 | 1356 | Lys-1 to Gly-8,   | H0197: 1 and  |  |  |

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| HFLSK81 | 761133 | 97  | 74 - 268  | 1357 | Thr-23 to Val-32.<br>Lys-13 to Asn-22.                      | H0246: 1.<br>H0199: 2 and<br>H0197: 1.  |                  |   |
| HFLUF43 | 928026 | 98  | 176 - 316 | 1358 | Lys-38 to Arg-47.   | H0199: 3, H0047:<br>1 and H0246: 1.   |                  |   |
| HFLUF44 | 522416 | 99  | 73 - 396  | 1359 | Gly-19 to Glu-26,<br>Pro-52 to Ser-58,<br>Glu-84 to Gly-94. | H0199: 2  | 12               |   |
| HFLUG50 | 526181 | 100 | 105 - 200 | 1360 |   | H0199: 2  |                  |   |
| HFLVE61 | 539872 | 101 | 1 - 393   | 1361 | Thr-17 to Gly-27.   | L0581: 9, L0748:<br>6, H0574: 5,<br>H0246: 5, H0632:<br>4, H0393: 3,<br>H0199: 3, H0510:<br>2, S0438: 2, L0809:<br>2, L0615: 1, H0357:<br>1, H0643: 1,<br>H0331: 1, L0021: 1,<br>H0197: 1, H0355:<br>1, H0509: 1, L0806:<br>1, L0807: 1, L0665:<br>1, H0144: 1,<br>H0520: 1, L0749: 1,<br>L0750: 1 and<br>L0757: 1. | 3p21.2-<br>p21.1 | 150250,<br>164500,<br>168468,<br>182280,<br>238310,<br>600163,<br>601226,<br>601916 |
| HFLVE85 | 531014 | 102 | 224 - 376 | 1362 | Pro-9 to Arg-23.  | H0246: 2  |                  |   |
| HFLV115 | 921860 | 103 | 196 - 441 | 1363 |   | H0197: 2 and<br>H0246: 2.   |                  |   |
| HFLVJ52 | 954506 | 104 | 1 - 108   | 1364 | Arg-18 to Arg-25.   | H0197: 3 and  |                  |   |

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| HFVBA62 | 754154 | 105 | 55 - 330  | 1365 |  | H0246: 3.                 |  |  |
| HFVGI78 | 935839 | 106 | 1 - 174   | 1366 |  | H0152: 1 and<br>H0509: 1. |  |  |
| HFVKG74 | 789130 | 107 | 53 - 277  | 1367 |  | H0393: 2                  |  |  |
| HFVHC25 | 678573 | 108 | 85 - 222  | 1368 | Lys-26 to Gly-36.                      | H0393: 2                  |  |  |
| HFVHE45 | 572837 | 109 | 198 - 380 | 1369 | Thr-1 to Lys-6.                        | H0393: 2 and<br>L0754: 1. |  |  |
| HFVHE66 | 572852 | 110 | 98 - 319  | 1370 |  | H0393: 2                  |  |  |
| HFVHF81 | 929124 | 111 | 136 - 291 | 1371 |  | H0393: 2                  |  |  |
| HFVHI01 | 916970 | 112 | 214 - 354 | 1372 | Gly-12 to Arg-20,<br>Lys-35 to Phe-40. | H0393: 2                  |  |  |
| HFVHM86 | 572830 | 113 | 2 - 289   | 1373 |  | H0393: 2                  |  |  |
| HFVHT75 | 573301 | 114 | 3 - 122   | 1374 |  | H0393: 1 and<br>H0014: 1. |  |  |
| HFVIH95 | 573198 | 115 | 121 - 270 | 1375 |  | H0393: 1 and<br>H0036: 1. |  |  |
| HFVII33 | 871980 | 116 | 2 - 271   | 1376 |  | H0393: 2                  |  |  |
| HGBAE29 | 537309 | 117 | 78 - 194  | 1377 |  | H0014: 3                  |  |  |
| HGBAH38 | 503211 | 118 | 10 - 108  | 1378 |  | H0014: 2                  |  |  |
| HGBAH80 | 932630 | 119 | 2 - 211   | 1379 |  | H0014: 2                  |  |  |
| HGBAI39 | 503055 | 120 | 189 - 326 | 1380 |  | H0014: 2                  |  |  |
| HGBAI42 | 503057 | 121 | 267 - 458 | 1381 | Gly-1 to Glu-11.                       | H0014: 3                  |  |  |
| HGBAI44 | 536599 | 122 | 75 - 278  | 1382 | Lys-8 to Pro-29,<br>Phe-46 to Asn-51.  | H0014: 3                  |  |  |
| HGBAI70 | 707918 | 123 | 106 - 216 | 1383 | Gln-1 to Arg-7.                        | H0014: 2                  |  |  |
| HGBAK23 | 500801 | 124 | 3 - 167   | 1384 | Tyr-3 to Gln-27,<br>Pro-29 to Arg-41.  | H0014: 2                  |  |  |



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| HGBAM36 | 509552 | 125 | 10 - 180  | 1385 | Tyr-11 to Leu-25.  | H0014: 3                            |         |   |
| HGBAM75 | 509546 | 126 | 79 - 198  | 1386 |  | H0014: 2                            |         |   |
| HGBAN21 | 509538 | 127 | 59 - 313  | 1387 | Lys-5 to Trp-17.   | H0014: 2                            |         |   |
| HGBAO08 | 854321 | 128 | 88 - 210  | 1388 |  | H0014: 3 and<br>L0750: 1.           | 6q14    | 136550,<br>203310,<br>269920,<br>602772   |
| HGBAP09 | 509265 | 129 | 9 - 266   | 1389 | Ile-13 to Cys-19,<br>Pro-21 to His-30,<br>Leu-40 to Trp-48,<br>Gly-60 to Ser-66. | H0014: 2                            |         |   |
| HGBAP42 | 509262 | 130 | 13 - 165  | 1390 |  | H0014: 3                            |         |   |
| HGBAQ37 | 500799 | 131 | 135 - 230 | 1391 |  | H0014: 3                            |         |   |
| HGBAQ81 | 509533 | 132 | 100 - 216 | 1392 |  | H0014: 2                            | 17p11.2 | 100710,<br>182290,<br>201475,<br>270200,<br>601097,<br>601097,<br>601097,<br>602666 |
| HGBAU10 | 961242 | 133 | 163 - 285 | 1393 |  | S0444: 1, H0014:<br>1 and L0764: 1. |         |   |
| HGBAU93 | 625250 | 134 | 1 - 252   | 1394 | Asn-8 to Arg-13,<br>Ser-33 to Ser-41,<br>Asp-49 to Arg-56.                       | H0014: 1 and<br>H0506: 1.           |         |   |
| HGBAZ13 | 971646 | 135 | 181 - 357 | 1395 | Arg-1 to Cys-6.  | H0014: 2                            |         |   |
| HGBBB48 | 503470 | 136 | 161 - 301 | 1396 | Leu-12 to Thr-18.  | H0015: 2                            |         |   |

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| HGBBO62 | 509691 | 137 | 249 - 515 | 1397 | Pro-14 to Ser-21.                                  | L0748: 2, H0036: 1 and H0015: 1.           |         |  |
| HGBBY74 | 509641 | 138 | 31 - 201  | 1398 | Pro-48 to Thr-53.                                  | H0015: 2                                   |         |  |
| HGBCH13 | 508982 | 139 | 1 - 279   | 1399 | Gln-51 to Gly-56.                                  | H0015: 2                                   |         |  |
| HGBCU23 | 508807 | 140 | 168 - 281 | 1400 | Glu-23 to Gln-28.                                  | H0014: 1 and H0015: 1.                     |         |  |
| HGBDB04 | 961510 | 141 | 2 - 280   | 1401 | His-20 to Thr-33.                                  | H0014: 2                                   |         |  |
| HGBDB21 | 753848 | 142 | 247 - 369 | 1402 |  | H0014: 3                                   |         |  |
| HGBDC48 | 960971 | 143 | 160 - 366 | 1403 | Ser-16 to Ser-22.                                  | H0014: 5                                   |         |  |
| HGBDD52 | 954496 | 144 | 320 - 499 | 1404 |  | H0014: 3, L0659: 1 and L0748: 1.           | 14q32.1 | 107280, 107280, 107400, 107400, 122500, 186960, 245200, 601841 |
| HGBDE16 | 533741 | 145 | 3 - 302   | 1405 |  | H0014: 2                                   |         |  |
| HGBDF61 | 742234 | 146 | 171 - 455 | 1406 | Lys-1 to Trp-6, Ala-8 to Asn-13, Ser-19 to Phe-24. | L0439: 2, S0354: 1, H0014: 1 and L0455: 1. |         |  |
| HGBDG59 | 522932 | 147 | 1 - 372   | 1407 | Ile-81 to Gln-88.                                  | H0014: 2                                   |         |  |
| HGBDG69 | 578390 | 148 | 1 - 333   | 1408 |  | H0014: 2                                   |         |  |
| HGBDH63 | 732530 | 149 | 157 - 62  | 1409 | Glu-16 to Gly-24.                                  | H0014: 2                                   |         |  |
| HGBDI95 | 509439 | 150 | 106 - 261 | 1410 |  | H0014: 2                                   |         |  |
| HGBDL05 | 932881 | 151 | 343 - 537 | 1411 | Pro-27 to Thr-32.                                  | H0014: 1, H0509: 1, L0748: 1 and L0758: 1. |         |  |

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| HGBDL72 | 710318 | 152 | 75 - 374  | 1412 | Ala-2 to Ala-7.   | H0014: 3   |                  |                              |
| HGBDU57 | 731004 | 153 | 2 - 121   | 1413 |   | H0014: 2   |                  |                              |
| HGBDX24 | 678576 | 154 | 178 - 321 | 1414 |   | L0774: 2, L0756:<br>2, L0731: 2, H0014:<br>1, L0794: 1, L0803:<br>1, L0743: 1, L0777:<br>1 and S0446: 1. |                  |                              |
| HGBDX35 | 503477 | 155 | 210 - 365 | 1415 |   | H0014: 2   |                  |                              |
| HGBDY02 | 921081 | 156 | 61 - 225  | 1416 |   | H0014: 2   |                  |                              |
| HGBDY30 | 503476 | 157 | 127 - 237 | 1417 | Cys-7 to Leu-22.  | H0014: 2   |                  |                              |
| HGBDY59 | 815818 | 158 | 3 - 455   | 1418 | Pro-6 to Thr-11:<br>AR050: 68,<br>AR054: 62,<br>AR051: 50,<br>AR089: 11,<br>AR061: 7<br>H0622: 2, L0659:<br>2 and H0014: 1. |  |                  |                              |
| HGBEY32 | 971570 | 159 | 114 - 227 | 1419 |   | H0014: 2   |                  |                              |
| HGBGA29 | 508433 | 160 | 1 - 141   | 1420 |   | H0014: 2   |                  |                              |
| HGBGI54 | 573764 | 161 | 107 - 271 | 1421 |   | H0014: 2   |                  |                              |
| HGBGI57 | 573752 | 162 | 107 - 187 | 1422 |   | H0014: 2 and<br>L0803: 1.  |                  |                              |
| HGBGO22 | 558830 | 163 | 69 - 359  | 1423 | Cys-1 to Cys-12,<br>Thr-30 to Ser-55,<br>Gly-59 to Val-66,<br>Gly-70 to Val-75.   | AR061: 7, AR089:<br>6<br>H0014: 2, L0790:<br>2, H0393: 1,<br>H0036: 1, H0622:<br>1, L0662: 1, L0768:     | 8q24.1-<br>q24.2 | 188450,<br>188450,<br>188450 |

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|         |        |      |           |      |  |  |  | 1, L0783: 1, L0809:<br>1, S0374: 1 and<br>L0779: 1. |  |  |  |
| HGBGT92 | 924780 | 164  | 2 - 166   | 1424 | Arg-10 to Ala-15,<br>Asp-27 to Arg-41.   |  |  | H0014: 2  |  |  |  |
| HGBGW04 | 573644 | 165  | 14 - 187  | 1425 | Gly-1 to Arg-8,<br>Arg-14 to Trp-25,<br>Ile-28 to Ala-41,<br>Gly-43 to Gly-51. |  |  | H0014: 2  |  |  |  |
| HGBHC35 | 573687 | 166  | 3 - 314   | 1426 | Gln-1 to Asn-6,<br>His-12 to Gly-17.   |  |  | H0014: 2  |  |  |  |
| HGBHM09 | 573673 | 167  | 7 - 186   | 1427 | Glu-1 to Ala-9,<br>Thr-36 to Arg-45,<br>Pro-55 to Pro-60.                      |  |  | H0014: 2  |  |  |  |
| HGBHN46 | 573678 | 168  | 2 - 100   | 1428 | Gly-15 to Gly-21,<br>Leu-23 to Ser-31.   |  |  | H0014: 3  |  |  |  |
| HGBHP95 | 781326 | 169  | 3 - 197   | 1429 | His-1 to Ala-8.  |  |  | H0014: 2  |  |  |  |
| HGBHS11 | 967385 | 170  | 79 - 225  | 1430 | Tyr-26 to Glu-34.  |  |  | H0014: 2  |  |  |  |
| HGBHY06 | 937940 | 171  | 3 - 296   | 1431 | His-1 to Phe-7.  |  |  | H0263: 1 and<br>H0014: 1.                           |  |  |  |
| HGBIC81 | 796500 | 172  | 1 - 108   | 1432 | Asn-1 to Trp-7.  |  |  | H0014: 2  |  |  |  |
| HGBID55 | 575197 | 173  | 118 - 249 | 1433 | Asn-1 to Ser-8.  |  |  | H0014: 1 and<br>H0015: 1.                           |  |  |  |
| HGOCB25 | 506771 | 174  | 171 - 347 | 1434 |  |  |  | H0018: 2  |  |  |  |
|         | 668759 | 1260 | 178 - 59  | 2520 | Ile-3 to Lys-9,<br>Pro-34 to Gln-40.   |  |  |   |  |  |  |
| HHLBA18 | 527530 | 175  | 51 - 164  | 1435 |  |  |  | T0091: 2  |  |  |  |
| HISAC25 | 678054 | 176  | 83 - 307  | 1436 | Lys-58 to Gly-69.  |  |  | L0598: 1, H0539:                                    |  |  |  |

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| HISAI35 | 707172 | 177 | 1 - 123   | 1437 | Ala-6 to Asn-15.   | 1, S0378: 1, L0748: 1 and L0698: 1.                        |  |  |
| HISAM61 | 974576 | 178 | 299 - 541 | 1438 | Arg-29 to Lys-35.  | H0539: 2   |  |  |
| HISAN16 | 661752 | 179 | 183 - 374 | 1439 | Ala-3 to Leu-10,<br>Gln-22 to Gly-27,<br>Ser-29 to Cys-36.     | H0539: 3   |  |  |
| HISAN47 | 710943 | 180 | 190 - 47  | 1440 | Ser-12 to Trp-20,<br>Pro-28 to Ser-41.                         | H0539: 2   |  |  |
| HISAT61 | 488809 | 181 | 197 - 373 | 1441 | Lys-3 to Asp-11.   | H0539: 2, L0022: 18p11.22-<br>1, L0649: 1 and<br>L0592: 1. |  |  |
| HISBA01 | 916165 | 182 | 141 - 260 | 1442 |  | H0539: 2   |  |  |
| HISBB09 | 964344 | 183 | 13 - 129  | 1443 |  | H0539: 2 and<br>L0753: 1.                                  |  |  |
| HISBB67 | 751467 | 184 | 9 - 269   | 1444 |  | H0539: 2   |  |  |
| HISBE32 | 677148 | 185 | 275 - 424 | 1445 | Val-17 to Ser-37.  | H0539: 3   |  |  |
| HISBG13 | 657005 | 186 | 45 - 170  | 1446 | Trp-16 to Asn-22,<br>Ile-37 to Thr-42.                         | H0539: 2 and<br>L0748: 1.                                  |  |  |
| HISBH10 | 964359 | 187 | 40 - 318  | 1447 | Ser-20 to Leu-36,<br>Arg-48 to Gln-61.                         | H0539: 2   |  |  |
| HISBJ96 | 796306 | 188 | 1 - 318   | 1448 | Pro-6 to Arg-26,<br>Pro-35 to Gly-51.                          | H0539: 2   |  |  |
| HISBO64 | 745884 | 189 | 28 - 135  | 1449 |  | H0539: 2   |  |  |
| HISBT02 | 919509 | 190 | 137 - 295 | 1450 | Gly-43 to Gln-48.  | H0539: 3   |  |  |
| HISBU45 | 717604 | 191 | 3 - 434   | 1451 | Glu-42 to Asn-67,<br>Gly-93 to His-100,<br>Ser-121 to Gly-126. | H0539: 3, L0657: 1 and L0777: 1.                           |  |  |
| HISBU68 | 693115 | 192 | 19 - 174  | 1452 | Arg-14 to Arg-19.  | H0539: 2   |  |  |

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| HISBW20 | 669525 | 193 | 155 - 412 | 1453 |  | H0539: 2, L0746: 1 and L0758: 1.           |  |  |
| HISCF72 | 740183 | 194 | 34 - 252  | 1454 | Gln-17 to Arg-27.  | H0539: 2                                   |  |  |
| HISCH85 | 761973 | 195 | 1 - 276   | 1455 | Ser-4 to Gly-14,<br>His-33 to Gly-47,<br>Gly-63 to Ala-73.                     | S0374: 1 and<br>H0539: 1.                  |  |  |
| HISCJ83 | 831507 | 196 | 105 - 374 | 1456 | Ser-1 to Asp-16.   | H0539: 2 and<br>L0747: 1.                  |  |  |
| HISCK85 | 857497 | 197 | 16 - 258  | 1457 |  | H0539: 2                                   |  |  |
| HISCL06 | 935079 | 198 | 48 - 245  | 1458 | Gly-50 to Trp-59.  | H0539: 2                                   |  |  |
| HISCN24 | 764837 | 199 | 148 - 300 | 1459 | Lys-9 to Asn-14.   | H0539: 2                                   |  |  |
| HISCP11 | 966171 | 200 | 2 - 376   | 1460 | Pro-7 to Pro-12.   | H0539: 2                                   |  |  |
| HISCV30 | 883892 | 201 | 248 - 532 | 1461 |  | H0014: 1, H0539: 1, L0748: 1 and L0756: 1. |  |  |
| HISDM43 | 974583 | 202 | 265 - 585 | 1462 | His-1 to Glu-6,<br>Glu-15 to Asp-20,<br>Thr-48 to Ser-53,<br>Asp-61 to Trp-69. | H0574: 1, H0539: 1 and L0779: 1.           |  |  |
| HISDO59 | 857479 | 203 | 498 - 776 | 1463 |  | H0085: 1 and<br>H0539: 1.                  |  |  |
| HISDS91 | 787603 | 204 | 31 - 189  | 1464 |  | H0539: 2 and<br>L0747: 1.                  |  |  |
| HISDT82 | 790966 | 205 | 170 - 490 | 1465 |  | H0539: 2                                   |  |  |
| HISDU39 | 745914 | 206 | 358 - 534 | 1466 |  | H0539: 2                                   |  |  |
| HISDV63 | 788753 | 207 | 193 - 375 | 1467 |  | H0539: 2                                   |  |  |
| HISDZ80 | 775474 | 208 | 46 - 420  | 1468 | Pro-5 to Arg-17,<br>Arg-24 to Pro-29.  | H0539: 2                                   |  |  |

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| HISEA07 | 952295 | 209 | 1 - 102   | 1469 | Leu-9 to Pro-19.                       | H0539: 2 and<br>L0439: 1.   |  |  |
| HISEE71 | 759828 | 210 | 3 - 170   | 1470 | Lys-24 to Ser-32.                      | H0539: 2  |  |  |
| HISEJ18 | 783919 | 211 | 2 - 142   | 1471 |  | H0539: 2  |  |  |
| HISEJ39 | 789809 | 212 | 188 - 334 | 1472 | Ser-11 to Arg-19.                      | H0539: 2  |  |  |
| HISEN88 | 760209 | 213 | 121 - 318 | 1473 |  | H0539: 2  |  |  |
| HISES80 | 775598 | 214 | 126 - 275 | 1474 |  | H0539: 2  |  |  |
| HLDAK38 | 689904 | 215 | 91 - 225  | 1475 | Gln-5 to Leu-11.                       | H0509: 3  |  |  |
| HLDBF84 | 924101 | 216 | 444 - 809 | 1476 | Leu-49 to Gln-55.                      | L0748: 24, H0574:<br>5, L0581: 4, H0510:<br>3, H0509: 3,<br>H0331: 2, H0632:<br>2, L0749: 2, H0057:<br>1, H0014: 1 and<br>L0794: 1. |  |  |
| HLDBJ86 | 882365 | 217 | 30 - 452  | 1477 |  | H0509: 2, H0510:<br>1 and L0774: 1.   |  |  |
| HLDBR32 | 752494 | 218 | 173 - 310 | 1478 | Lys-2 to Asn-11.                       | H0509: 1 and<br>H0539: 1.   |  |  |
| HLDC51  | 871341 | 219 | 14 - 169  | 1479 |  | H0509: 1 and<br>H0595: 1.   |  |  |
| HLDCG82 | 657567 | 220 | 381 - 542 | 1480 | Pro-36 to Asp-41.                      | H0509: 1 and<br>H0539: 1.   |  |  |
| HLDCI35 | 831356 | 221 | 66 - 725  | 1481 | Val-39 to Lys-47,<br>Cys-81 to Trp-86. | AR061: 3, AR089:<br>1<br>L0748: 7, L0791:<br>2, H0597: 1,<br>H0509: 1, L0803: 1,  |  |  |

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| HLDCU27 | 950724 | 222 | 2 - 316   | 1482 | Asp-16 to Gly-30,<br>Pro-34 to Gly-48,<br>Val-50 to Lys-55,<br>Ser-61 to Asp-70,<br>Pro-73 to Gly-78. | L0804: 1 and<br>L0581: 1.<br>AR061: 2, AR089:<br>1<br>H0509: 2, L0774:<br>2, H0393: 1,<br>H0184: 1, L0471: 1,<br>L0363: 1, L0768: 1,<br>L0375: 1, L0634: 1,<br>L0809: 1, L0743: 1<br>and L0777: 1. |         |  |
| HLDDH01 | 926360 | 223 | 3 - 326   | 1483 | Ala-14 to Arg-21,<br>Pro-67 to Arg-72.  | AR089: 2, AR061:<br>2<br>H0509: 1 and<br>H0478: 1.   |         |  |
| HLDDI91 | 790003 | 224 | 258 - 608 | 1484 | Glu-1 to Ser-18;<br>Lys-62 to Ile-67.   | AR089: 0, AR061:<br>0<br>H0355: 1, H0509:<br>1 and L0748: 1.   |         |  |
| HLDDK12 | 923442 | 225 | 108 - 242 | 1485 | Asn-19 to Pro-33,<br>Lys-40 to Asp-45.  | H0590: 1 and<br>H0509: 1.  |         |  |
| HLDDL55 | 875000 | 226 | 456 - 262 | 1486 | Thr-19 to Ser-29.   | H0509: 2, L0774:<br>2, H0393: 1,<br>H0184: 1, L0471: 1,<br>L0363: 1, L0768: 1,<br>L0375: 1, L0634: 1,<br>L0809: 1, L0743: 1<br>and L0777: 1.   |         |  |
| HLDNJ57 | 733903 | 227 | 1 - 261   | 1487 |   | L0748: 2, L0758:<br>8p22   | 148370, |  |



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|         |        |     |          |      |  |  |   | 2, H0574: 1,<br>H0510: 1, S0438: 1<br>and L0665: 1. |  | 238600,<br>238600,<br>238600,<br>238600,<br>600143,<br>601385,<br>602629 |
| HLDNU53 | 883158 | 228 | 2 - 478  | 1488 | Leu-10 to Glu-28,<br>Ala-32 to Ala-54,<br>Ser-62 to Ser-69,<br>Gly-78 to Arg-92. |  | L0748: 14, L0803:<br>5, L0749: 5, H0331:<br>2, H0510: 2, L0766:<br>2, L0581: 2, H0574:<br>1, H0632: 1, L0774:<br>1, L0439: 1, L0750:<br>1 and L0777: 1. |   |  |  |
| HLDOA63 | 949166 | 229 | 69 - 521 | 1489 | Leu-2 to Gln-9,<br>Pro-11 to Gln-26,<br>Lys-65 to Pro-70.                        |  | AR089: 17,<br>AR061: 16<br>H0510: 2, L0581:<br>2 and H0355: 1.  |   |  |  |
| HLDOB53 | 728220 | 230 | 76 - 189 | 1490 |  |  | H0510: 2  |   |  |  |
| HLDOG86 | 682265 | 231 | 83 - 163 | 1491 |  |  | H0574: 2, H0510:<br>2, L0749: 2, H0331:<br>1, L0021: 1 and<br>L0748: 1.   |   |  |  |
| HLDON90 | 788891 | 232 | 2 - 145  | 1492 | Lys-1 to Arg-10.   |  | AR089: 7, AR061:<br>3<br>H0622: 2, L0535:<br>2, H0510: 1,<br>H0039: 1, L0369: 1,<br>L0748: 1 and  |   |  |  |

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| HLDOR73 | 683262 | 233 | 132 - 269  | 1493 | Phe-7 to Asn-31.   | L0749: 1.  |
| HLDQU12 | 857106 | 234 | 167 - 370  | 1494 | Thr-20 to Gly-26,<br>Leu-49 to Ser-55.   | H0510: 2<br>H0510: 4, H0509:<br>1 and S0380: 1.  |
| HLDQZ69 | 697988 | 235 | 1 - 351    | 1495 | Asn-23 to Ser-31,<br>Thr-74 to Thr-82.   | H0510: 2   |
| HLDPA63 | 744341 | 236 | 114 - 257  | 1496 | Arg-19 to Phe-27.  | H0510: 2   |
| HLDQA88 | 796173 | 237 | 1 - 246    | 1497 |  | H0510: 1 and<br>H0595: 1.  |
| HLDQB65 | 708002 | 238 | 1 - 168    | 1498 | Arg-1 to Trp-7,<br>Gly-12 to Gly-23,<br>Ile-27 to Lys-32,<br>Arg-47 to Val-56. | H0510: 3 and<br>L0731: 1.  |
| HLDQC62 | 923559 | 239 | 838 - 1083 | 1499 | Arg-40 to Leu-45.  | L0748: 5, H0510:<br>4, H0632: 1,<br>H0509: 1 and<br>L0749: 1.  |
| HLDQH10 | 932015 | 240 | 130 - 318  | 1500 |  | H0510: 2 and<br>L0755: 1.  |
| HLDQQ76 | 953312 | 241 | 37 - 321   | 1501 | Glu-22 to Ser-28,<br>Arg-59 to Pro-67.   | H0510: 3, L0581:<br>2, L0662: 1 and<br>L0777: 1.   |
| HLDRD44 | 697576 | 242 | 451 - 645  | 1502 | Phe-7 to Tyr-13,<br>Thr-32 to Lys-39.  | L0803: 10, H0510:<br>6, H0355: 4, L0581:<br>3, H0393: 2, L0775:<br>2, H0574: 1,<br>H0632: 1, H0098:<br>1, H0014: 1,<br>H0509: 1, L0804: 1, |

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| HLD RD54 | 727954 | 243 | 83 - 265 | 1503 |  | Val-4 to Asn-10,<br>Pro-44 to Arg-50.   |  | H0510: 2  |    |  |
| HLD RE26 | 681284 | 244 | 17 - 187 | 1504 |  | Lys-5 to Asn-14.  |  | H0574: 2, H0510:<br>2 and L0754: 1.   |    |  |
| HLD RE66 | 966517 | 245 | 60 - 206 | 1505 |  | His-12 to Gln-17,<br>Leu-39 to Thr-44.  |  | H0510: 2  |    |  |
| HLD RI94 | 784582 | 246 | 10 - 114 | 1506 |  | Trp-4 to Gln-11.  |  | L0748: 2, H0098:<br>1 and H0510: 1.   | 16 |  |
| HLD RP14 | 657908 | 247 | 3 - 188  | 1507 |  |   |  | S0376: 1, H0510:<br>1 and L0752: 1.   |    |  |
| HLD RQ82 | 837031 | 248 | 3 - 461  | 1508 |  | Arg-13 to Glu-20,<br>Asn-26 to Asp-32,<br>Thr-57 to Asn-82.                     |  | L0581: 3 and<br>H0510: 2.   |    |  |
| HLD RR54 | 708594 | 249 | 1 - 180  | 1509 |  | Thr-5 to Arg-11,<br>Gln-21 to Ile-44.   |  | H0510: 2  |    |  |
| HLI BI35 | 870387 | 250 | 1 - 195  | 1510 |  | Pro-10 to Ala-17.   |  | H0574: 1 and<br>H0355: 1.   |    |  |
| HLI BI13 | 910830 | 251 | 3 - 422  | 1511 |  | Thr-1 to Gly-23,<br>Asn-33 to Gly-40,<br>Arg-45 to Gln-50,<br>Arg-70 to Phe-77. |  | AR061: 3, AR089:<br>2<br>L0803: 10, H0510:<br>6, H0355: 5, L0581:<br>3, H0393: 2, L0775:<br>2, H0574: 1,<br>H0632: 1, H0098:<br>1, H0014: 1,<br>H0509: 1, L0804: 1,<br>L0790: 1, H0144: 1 |    |  |

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| HLIBO03 | 923519 | 252 | 206 - 316 | 1512 |   |  | and L0748: 1.   |            |   |
| HLIBP66 | 750608 | 253 | 91 - 171  | 1513 |   |  | H0355: 2  |            |   |
| HLIBZ48 | 721023 | 254 | 8 - 235   | 1514 | Ser-8 to Thr-18.  |  | H0355: 2  |            |   |
| HLICR73 | 837030 | 255 | 1 - 444   | 1515 | Asp-41 to Gly-47,<br>Pro-65 to Thr-72,<br>Thr-90 to Phe-95. |  | H0015: 1, H0355:<br>1 and L0749: 1.                                       |            |   |
| HLICT47 | 929754 | 256 | 116 - 355 | 1516 | Thr-20 to Arg-26,<br>Leu-30 to Ser-35.                      |  | AR061: 9, AR089:<br>2<br>H0510: 3, L0393:<br>1, H0355: 1 and<br>L0581: 1. |            |   |
| HLICT57 | 734451 | 257 | 1 - 186   | 1517 | Ser-19 to Ala-25,<br>Glu-31 to Thr-41,<br>Ser-49 to Arg-54. |  | H0355: 2  |            |   |
| HLPBD66 | 928708 | 258 | 24 - 218  | 1518 | His-1 to Arg-19.  |  | H0349: 3  |            |   |
| HLQAF70 | 529348 | 259 | 94 - 174  | 1519 | Gly-20 to Asn-27.   |  | H0331: 2  |            |   |
| HLQAL33 | 702755 | 260 | 54 - 344  | 1520 |   |  | L0754: 2, H0331:<br>1 and H0622: 1.                                       |            |   |
| HLQAN64 | 966910 | 261 | 439 - 113 | 1521 |   |  | L0748: 3, L0749:<br>2, H0331: 1,<br>H0574: 1, L0774: 1<br>and H0506: 1.   | 3p21.3-p22 | 116806,<br>120120,<br>120120,<br>120120,<br>120120,<br>120436,<br>120436,<br>120436,<br>138320,<br>168468,<br>182280, |

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|         |        |     |           |      |                                       |  |   | 190182,<br>190182,<br>227646,<br>261510,<br>600163,<br>601154 |
| HLQAZ69 | 960046 | 262 | 2 - 199   | 1522 | Ala-1 to Gln-12,<br>Ala-15 to Arg-23. | H0331: 2   |   |   |
| HLQBF72 | 608371 | 263 | 108 - 284 | 1523 | Ser-1 to Phe-7.                       | AR089: 25,<br>AR061: 9<br>H0331: 2   |   |   |
| HLQBH46 | 527923 | 264 | 49 - 213  | 1524 | Asp-13 to Asn-20.                     | H0331: 2   |   |   |
| HLQBI21 | 529342 | 265 | 204 - 464 | 1525 |                                       | H0574: 3, H0331: 20p12<br>2, H0510: 2,<br>H0632: 1, L0021: 1,<br>L0803: 1 and<br>L0748: 1. | 112261,<br>176640,<br>176640,<br>176640,<br>236700,<br>601920 |   |
| HLQBL71 | 542262 | 266 | 79 - 162  | 1526 |                                       | H0331: 2   |   |   |
| HLQBX13 | 856783 | 267 | 2 - 163   | 1527 |                                       | AR054: 16,<br>AR050: 11,<br>AR051: 2<br>H0331: 2   |   |   |
| HLQBX23 | 676205 | 268 | 184 - 330 | 1528 |                                       | H0331: 2   |   |   |
| HLQCN58 | 706239 | 269 | 131 - 244 | 1529 | Arg-22 to Arg-27.                     | H0574: 2, H0331: 1<br>and L0697: 1.  |   |   |
| HLQCY26 | 681459 | 270 | 176 - 271 | 1530 |                                       | H0574: 2   |   |   |
| HLQDB55 | 731601 | 271 | 233 - 361 | 1531 |                                       | H0574: 2   |   |   |

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| HLQDC82 | 779697 | 272 | 1 - 147   | 1532 |   | S0358: 2, L0666:<br>2, L0748: 2, L0751:<br>2, H0574: 1, L0770:<br>1, L0764: 1, L0771:<br>1, L0806: 1, L0519:<br>1, L0438: 1, L0745:<br>1, L0747: 1, L0749:<br>1, L0777: 1, L0731:<br>1, L0608: 1 and<br>L0593: 1. |  |  |
| HLQDE61 | 741706 | 273 | 102 - 266 | 1533 | Gln-9 to Thr-17,<br>Gln-30 to Lys-36,<br>Ser-42 to Val-48.  | H0331: 1 and<br>H0574: 1.   |  |  |
| HLQDP11 | 966775 | 274 | 47 - 328  | 1534 |   | H0574: 2  |  |  |
| HLQDU40 | 488692 | 275 | 3 - 185   | 1535 | His-3 to Tyr-9,<br>His-39 to Cys-44.                        | L0766: 5, H0574:<br>2 and L0365: 1.   |  |  |
| HLQDY10 | 856755 | 276 | 153 - 416 | 1536 | Tyr-13 to Lys-18,<br>Lys-38 to Gln-43,<br>Gly-66 to Trp-72. | H0574: 2  |  |  |
| HLQED11 | 966015 | 277 | 20 - 202  | 1537 | Pro-15 to Pro-21,<br>Pro-27 to Glu-32.                      | H0574: 1 and<br>H0632: 1.   |  |  |
| HLQEH54 | 871683 | 278 | 292 - 531 | 1538 | Ser-13 to Phe-19,<br>Gln-47 to Glu-75.                      | L0748: 9, L0749:<br>5, L0777: 2, H0574:<br>1 and H0349: 1.  |  |  |
| HLQES58 | 856725 | 279 | 11 - 226  | 1539 | Asn-31 to Leu-37.   | H0331: 1 and<br>H0574: 1.   |  |  |
| HLQEY16 | 856712 | 280 | 157 - 375 | 1540 | Phe-21 to Gln-28.   | H0574: 1 and<br>S0374: 1.   |  |  |
| HLQFD23 | 856701 | 281 | 317 - 448 | 1541 |   | H0574: 2  |  |  |

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| HLQFO69 | 933385 | 282 | 245 - 553  | 1542 | Asn-1 to Glu-7.   | AR089: 1, AR061:<br>1<br>S0360: 1 and<br>H0574: 1.  |          |                              |
| HLQKG74 | 856736 | 283 | 475 - 864  | 1543 | Glu-28 to His-39,<br>Arg-49 to Lys-56.  | L0748: 14, L0803:<br>5, L0749: 5, H0331:<br>2, H0510: 2, L0766:<br>2, L0581: 2, H0574:<br>1, H0632: 1, L0774:<br>1, L0439: 1, L0750:<br>1 and L0777: 1. |          |                              |
| HLQGN56 | 842004 | 284 | 201 - 431  | 1544 | Arg-45 to Gly-51.   | L0748: 3, H0331:<br>1, H0632: 1 and<br>H0509: 1.  |          |                              |
| HLXTF06 | 931101 | 285 | 72 - 293   | 1545 | Pro-19 to Arg-25,<br>Gln-32 to Lys-37,<br>Pro-48 to Arg-54.   | S0450: 2  |          |                              |
| HNAAA40 | 574045 | 286 | 173 - 328  | 1546 |   | H0379: 2  |          |                              |
| HNAAE33 | 574001 | 287 | 11 - 190   | 1547 |   | H0379: 2  |          |                              |
| HNAAE73 | 922929 | 288 | 67 - 348   | 1548 | Pro-1 to Gly-11,<br>Pro-18 to Pro-24.   | H0379: 1 and<br>H0380: 1.   | 22q13.31 | 250100,<br>250800,<br>250800 |
| HNALD49 | 723168 | 289 | 373 - 609  | 1549 | Cys-43 to Gly-56.   | H0380: 2 and<br>L0747: 1.   |          |                              |
| HNJBA08 | 955993 | 290 | 380 - 1453 | 1550 | Lys-1 to Met-11,<br>Glu-21 to Asp-28,<br>Arg-44 to Ala-51,<br>Glu-98 to His-106,<br>Thr-173 to Ile-179, | H0632: 1 and<br>S0328: 1.   |          |                              |

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|         |        |     |           |      |  |  | Asn-209 to Ala-219,<br>Thr-256 to Thr-261,<br>Arg-267 to Lys-280,<br>Asp-299 to Lys-305,<br>Glu-329 to Lys-334.            |  |  |  |  |   |  |  |  |  |  |
| HNJBB04 | 927458 | 291 | 22 - 171  | 1551 |  |  | Lys-11 to Arg-16.  |  |  |  | S0328: 2   |   |  |  |  |  |  |
| HNJB180 | 947047 | 292 | 311 - 490 | 1552 |  |  | Asp-1 to Gly-12.   |  |  |  | H0622: 1, L0646:<br>1, L0790: 1, S0328:<br>1 and L0596: 1.                 |   |  |  |  |  |  |
| HNJBL71 | 939266 | 293 | 71 - 616  | 1553 |  |  | Asp-1 to Asn-7,<br>Arg-17 to Leu-23,<br>Leu-32 to Gln-46,<br>Pro-63 to Pro-70,<br>Ala-87 to Gln-92,<br>Ser-165 to Leu-170. |  |  |  | S0328: 1 and<br>S0330: 1.  | 2 |  |  |  |  |  |
| HNJBN94 | 948996 | 294 | 1 - 639   | 1554 |  |  | Leu-40 to Asn-45.  |  |  |  | AR089: 1, AR061:<br>1<br>S0328: 13, S0330:<br>7, S0464: 1 and<br>S0350: 1. |   |  |  |  |  |  |
| HNJBW16 | 955920 | 295 | 254 - 481 | 1555 |  |  | Pro-1 to Leu-7,<br>Val-11 to Arg-18.   |  |  |  | S0328: 4   |   |  |  |  |  |  |
| HNJCD23 | 961494 | 296 | 89 - 292  | 1556 |  |  | Arg-1 to Gly-37,<br>Arg-39 to Asn-53,<br>Val-61 to Lys-68.   |  |  |  | S0328: 3   |   |  |  |  |  |  |
| HNJCH53 | 969065 | 297 | 434 - 745 | 1557 |  |  | Lys-52 to Ala-57.  |  |  |  | S0328: 4, L0662:<br>2, L0666: 2, L0731:<br>2, L0803: 1 and<br>L0665: 1.    |   |  |  |  |  |  |



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| HNJEA92 | 955842 | 298 | 46 - 837  | 1558 | Arg-175 to Arg-180,<br>Cys-188 to Gly-193.                  | S0330: 183,<br>S0328: 86, H0593:<br>16, S0456: 3,<br>S0446: 3, H0619: 2,<br>H0042: 1, H0575:<br>1, L0508: 1, S0350:<br>1 and L0600: 1. |  |  |
| HNJEC12 | 969099 | 299 | 461 - 661 | 1559 |   | L0744: 5, S0328:<br>3, L0731: 3, L0805:<br>2, L0806: 1 and<br>L0666: 1.  |  |  |
| HNJFC68 | 956178 | 300 | 358 - 495 | 1560 | Pro-38 to Lys-46.   | S0328: 3, L0766:<br>2 and L0779: 1.  |  |  |
| HNKBB44 | 955843 | 301 | 834 - 274 | 1561 | Arg-98 to Arg-103,<br>Cys-111 to Gly-116.                   | S0330: 24, S0328:<br>3, L0789: 1 and<br>H0593: 1.  |  |  |
| HNKBR49 | 955844 | 302 | 65 - 274  | 1562 | Lys-13 to Asn-24,<br>Lys-40 to Gln-49,<br>Asp-58 to Ala-70. | S0330: 183,<br>S0328: 86, H0593:<br>16, S0456: 3,<br>S0446: 3, H0619: 2,<br>H0042: 1, H0575:<br>1, L0508: 1, S0350:<br>1 and L0600: 1. |  |  |
| HNKBS78 | 955565 | 303 | 799 - 227 | 1563 |   | S0330: 16, S0328:<br>2, L0806: 1 and<br>L0600: 1.  |  |  |
| HNKBV10 | 961542 | 304 | 209 - 451 | 1564 |   | S0330: 3   |  |  |
| HNKCF21 | 951659 | 305 | 1 - 993   | 1565 | Asn-25 to Tyr-44,<br>Ala-80 to Asn-86,                      | S0330: 9 and<br>S0328: 6.  |  |  |

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|         |        |     |           |      |  | Ala-105 to Asp-119,<br>Pro-161 to Cys-170,<br>Ser-174 to Phe-180,<br>Glu-182 to Trp-187,<br>Phe-190 to Gln-195,<br>Lys-221 to Ala-233,<br>Tyr-261 to Met-267,<br>Thr-310 to Ser-331. |  |  |  |  |
| HNKCG51 | 933428 | 306 | 342 - 689 | 1566 |  | Ser-64 to Leu-71,<br>Thr-74 to Ser-79,<br>Phe-95 to Asp-106.   |  | L0766: 4, S0330:<br>2, L0777: 2, L0748:<br>1, L0751: 1 and<br>L0731: 1.  |  |  |
| HNKDV89 | 963354 | 307 | 282 - 440 | 1567 |  | Arg-9 to Ser-15,<br>Tyr-18 to Gly-24.  |  | L0756: 3, L0768:<br>2, L0794: 2, L0005:<br>1, L0520: 1, L0766:<br>1, L0803: 1, S0374:<br>1, L0438: 1, S0330:<br>1, L0779: 1 and<br>L0759: 1. |  |  |
| HOCNE77 | 832202 | 308 | 2 - 217   | 1568 |  | Thr-7 to Gly-17.   |  | S0442: 1 and<br>S0374: 1.  |  |  |
| HPASB03 | 925360 | 309 | 1 - 291   | 1569 |  |  |  | H0270: 1 and<br>S0378: 1.  |  |  |
| HPASD70 | 522675 | 310 | 121 - 234 | 1570 |  |  |  | L0774: 3, L0803:<br>2, S0374: 2, S0354:<br>1, S0358: 1, H0270:<br>1, H0036: 1 and<br>L0758: 1.   |  |  |
| HPKAA65 | 753931 | 311 | 27 - 146  | 1571 |  | Ser-32 to His-40.  |  | H0478: 170.  |  |  |

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| HROAF59 | 961784 | 312 | 2 - 259 | 1572 |  |  | S0392: 80, H0479: 33, H0447: 29, H0448: 17, H0096: 15, H0486: 10, S0330: 6, H0485: 3, H0510: 2, H0035: 2, S0280: 1, H0038: 1, H0488: 1, S0352: 1, H0509: 1, H0522: 1, S0432: 1 and H0542: 1.<br>S0376: 1 and H0316: 1. | 5q31 | 121050,<br>131400,<br>138040,<br>153455,<br>159000,<br>179095,<br>181460,<br>192974,<br>192974,<br>600807,<br>601596,<br>601692,<br>601692,<br>601692,<br>601692,<br>602089,<br>602121,<br>602460 |
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| HROAL51 | 526487 | 313 | 73 - 213  | 1573 |  |  | H0316: 2                          |  |
| HROAO26 | 531173 | 314 | 1 - 129   | 1574 |  |  | H0316: 2                          |  |
| HROAT53 | 669179 | 315 | 169 - 273 | 1575 |  |  | H0316: 2                          |  |
| HROAV94 | 963714 | 316 | 70 - 294  | 1576 | Ser-1 to Asn-14.                       |  | H0316: 1 and<br>H0598: 1.         |  |
| HROBC76 | 880935 | 317 | 3 - 248   | 1577 |  |  | AR061: 9, AR089:<br>3<br>H0598: 2 |  |
| HROBF58 | 735601 | 318 | 45 - 362  | 1578 | Arg-34 to Lys-40.                      |  | H0598: 2                          |  |
| HROBF77 | 677615 | 319 | 67 - 225  | 1579 |  |  | H0316: 1 and<br>H0598: 1.         |  |
| HROBM06 | 934681 | 320 | 52 - 210  | 1580 | Pro-48 to Pro-53.                      |  | H0316: 1 and<br>H0598: 1.         |  |
| HROBQ03 | 867044 | 321 | 169 - 399 | 1581 | Lys-6 to Lys-12.                       |  | H0598: 2                          |  |
| HROBV96 | 867038 | 322 | 265 - 459 | 1582 |  |  | H0598: 2                          |  |
| HROBX40 | 835594 | 323 | 3 - 209   | 1583 | Pro-27 to Asn-35.                      |  | H0316: 1 and<br>H0598: 1.         |  |
| HROCE61 | 741263 | 324 | 93 - 212  | 1584 |  |  | H0316: 1 and<br>H0598: 1.         |  |
| HRODC11 | 966298 | 325 | 28 - 183  | 1585 |  |  | H0598: 2                          |  |
| HRODF69 | 766014 | 326 | 103 - 342 | 1586 | Pro-16 to Lys-23,<br>Pro-44 to Pro-50. |  | H0598: 2                          |  |
| HRODH54 | 922899 | 327 | 2 - 142   | 1587 |  |  | S0354: 2 and<br>H0598: 1.         |  |
| HRODJ28 | 685922 | 328 | 423 - 599 | 1588 |  |  | H0598: 2                          |  |
| HRODP45 | 717316 | 329 | 1 - 267   | 1589 | Pro-20 to Asn-32,<br>Pro-34 to Asp-43. |  | H0316: 1 and<br>H0598: 1.         |  |
| HRODV70 | 841930 | 330 | 128 - 280 | 1590 | Ser-11 to Ser-17.                      |  | H0316: 2 and                      |  |

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| HRDX50  | 722502 | 331 | 26 - 127  | 1591 |  |  | H0598: 1.                           |         |  |
| HR0EA83 | 710615 | 332 | 31 - 255  | 1592 | Lys-17 to Cys-31,<br>Thr-47 to Gln-57. |  | H0598: 2<br>L0517: 1.               |         |  |
| HRQEB10 | 963706 | 333 | 100 - 213 | 1593 |  |  | H0598: 1 and<br>H0343: 1.           |         |  |
| HSWSC41 | 576407 | 334 | 33 - 179  | 1594 | Lys-26 to Gly-38.                      |  | H0447: 3, H0448:<br>3 and L0772: 1. |         |  |
| HSIAL23 | 508122 | 335 | 58 - 165  | 1595 |  |  | H0331: 1 and<br>H0036: 1.           |         |  |
| HSICN48 | 524767 | 336 | 103 - 294 | 1596 | Val-15 to Ala-23,<br>Lys-34 to Glu-42. |  | H0036: 2                            |         |  |
| HSICO48 | 529162 | 337 | 2 - 82    | 1597 |  |  | H0036: 1 and<br>H0343: 1.           |         |  |
| HSICP51 | 531307 | 338 | 102 - 254 | 1598 | Pro-3 to Trp-16.                       |  | H0036: 2                            | 21q22.3 | 120220,<br>120240,<br>123580,<br>151385,<br>171860,<br>190685,<br>236100,<br>236200,<br>240300,<br>267750,<br>600065,<br>601072,<br>601145 |
| HSICR32 | 507173 | 339 | 187 - 80  | 1599 |  |  | H0036: 2                            |         |  |
| HSICR69 | 531061 | 340 | 127 - 273 | 1600 | Ser-14 to Lys-19.                      |  | AR089: 2, AR061:                    |         |  |

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| HSICU08 | 960072 | 341 | 128 - 238 | 1601 | Pro-15 to Gly-20,<br>Pro-22 to His-37.   |  | H0036: 2                  |       |  |  |   |  |  |
| HSICV54 | 575344 | 342 | 2 - 157   | 1602 |  |  | H0036: 2                  |       |  |  |   |  |  |
| HSICV78 | 712629 | 343 | 175 - 369 | 1603 | Gly-41 to Gly-54.  |  | H0036: 2                  | 17q25 |  |  | 114290,<br>138033,<br>162100,<br>170500,<br>170500,<br>170500,<br>180860,<br>264470 |  |  |
| HSICX21 | 531267 | 344 | 223 - 378 | 1604 | Asn-5 to His-12.   |  | AR089: 2, AR061:<br>0     |       |  |  |   |  |  |
| HSICY35 | 713308 | 345 | 53 - 238  | 1605 | Glu-10 to Ser-25.  |  | H0036: 2                  |       |  |  |   |  |  |
| HSIDA42 | 531264 | 346 | 102 - 212 | 1606 | Gln-10 to Ser-15,<br>Met-23 to Ser-29.   |  | H0036: 1.<br>H0036: 2     |       |  |  |   |  |  |
| HSIDD83 | 531260 | 347 | 102 - 389 | 1607 | Glu-17 to Gly-30,<br>Glu-34 to Gly-40,<br>Lys-60 to Pro-65,<br>His-84 to Arg-90. |  | H0036: 2 and<br>L0599: 1. |       |  |  |   |  |  |
| HSIDG40 | 531071 | 348 | 92 - 310  | 1608 | Pro-11 to Cys-17,<br>Pro-31 to Pro-39.   |  | H0036: 2                  |       |  |  |   |  |  |
| HSIDH73 | 531293 | 349 | 150 - 314 | 1609 | His-3 to Pro-9.  |  | H0036: 2                  |       |  |  |   |  |  |
| HSIDJ20 | 526993 | 350 | 2 - 256   | 1610 |  |  | H0036: 3 and<br>L0759: 1. |       |  |  |   |  |  |

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| HSIDK12 | 531255 | 351  | 2 - 262   | 1611 |  |  | H0036: 2   |                   |        |
| HSIDO23 | 526974 | 352  | 62 - 190  | 1612 | Lys-1 to Pro-14,<br>Pro-25 to Glu-39.  |  | H0036: 3 and<br>L0471: 1.  |                   |        |
| HSIDP49 | 531064 | 353  | 28 - 168  | 1613 |  |  | H0036: 2   |                   |        |
| HSIDS36 | 531251 | 354  | 241 - 396 | 1614 |  |  | H0036: 2   |                   |        |
| HSIDT29 | 522341 | 355  | 177 - 329 | 1615 |  |  | H0036: 3   |                   |        |
| HSIDT51 | 874598 | 356  | 17 - 331  | 1616 | Thr-8 to Val-20,<br>Pro-43 to His-48,<br>Gln-52 to Gln-58.                         |  | H0036: 2   |                   |        |
| HSIDV27 | 531246 | 357  | 137 - 319 | 1617 | Val-10 to Leu-22.  |  | H0036: 2   |                   |        |
| HSIDV70 | 925083 | 358  | 43 - 186  | 1618 |  |  | H0036: 2   |                   |        |
| HSIDV75 | 531265 | 359  | 110 - 280 | 1619 | Pro-12 to Lys-17,<br>Phe-45 to Ser-52.   |  | H0036: 2   |                   |        |
| HSIDV82 | 531297 | 360  | 40 - 240  | 1620 | Tyr-1 to Val-6.  |  | H0036: 2   | 10q25.2-<br>q26.3 | 263700 |
| HSIDW39 | 775139 | 361  | 1 - 501   | 1621 |  |  | AR051: 12,<br>AR054: 9, AR061:<br>5, AR089: 2,<br>AR050: 0<br>H0036: 2, H0590:<br>2, S0354: 1, H0510:<br>1 and L0748: 1. |                   |        |
|         | 830774 | 1261 | 12 - 419  | 2521 | Glu-40 to Trp-57,<br>Tyr-59 to Phe-64,<br>Glu-91 to Arg-99,<br>Asp-106 to Arg-114. |  |  |                   |        |
| HSIDX79 | 712026 | 362  | 165 - 299 | 1622 |  |  | H0036: 2 and<br>H0590: 1.  |                   |        |

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| HSIDZ20 | 920867 | 363 | 2 - 109   | 1623 | Pro-18 to Glu-23.   | H0036: 2  |  |  |
| HSIEE78 | 904664 | 364 | 1 - 1044  | 1624 | Thr-5 to Ser-12,<br>Pro-26 to Ser-31,<br>Gln-46 to Gly-52.  | AR054: 10,<br>AR050: 9, AR051:<br>2<br>S0358: 5, S0354:<br>4, L0596: 3, S0356:<br>2, H0036: 2,<br>H0590: 2, L0771: 2,<br>L0758: 2, S0376: 1,<br>S0360: 1, T0109: 1,<br>L0040: 1, H0039: 1,<br>H0038: 1, H0616:<br>1, L0646: 1, L0764:<br>1, L0768: 1, L0775:<br>1, L0659: 1, S0374:<br>1, S0404: 1 and<br>H0506: 1. |  |  |
| HSIEH45 | 531294 | 365 | 151 - 300 | 1625 |   | H0036: 2  |  |  |
| HSIEH84 | 531300 | 366 | 1 - 153   | 1626 |   | H0036: 2  |  |  |
| HSIEO17 | 922867 | 367 | 1 - 1017  | 1627 |   | H0036: 1 and<br>H0590: 1.   |  |  |
| HSIEO62 | 531249 | 368 | 16 - 222  | 1628 |   | H0036: 2  |  |  |
| HSIFa06 | 866573 | 369 | 62 - 334  | 1629 |   | H0590: 2  |  |  |
| HSIFa29 | 690277 | 370 | 180 - 338 | 1630 |   | H0590: 2  |  |  |
| HSIFC65 | 733694 | 371 | 1 - 333   | 1631 | Leu-16 to Arg-31,<br>Leu-39 to Gly-61,<br>Ser-68 to Leu-79. | H0590: 1 and<br>H0039: 1.   |  |  |
| HSIFE08 | 839907 | 372 | 325 - 690 | 1632 |   | H0590: 2, H0036:<br>1 and L0601: 1.   |  |  |



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| HSIFE23 | 675419 | 373 | 229 - 435 | 1633 |  | H0590: 2  |      |   |
| HSIFE28 | 686056 | 374 | 160 - 14  | 1634 | Met-26 to Trp-31.                      | H0590: 2  |      |   |
| HSIFE46 | 718731 | 375 | 40 - 231  | 1635 |  | H0036: 2 and<br>H0590: 1.   | 2p23 | 143450,<br>182601,<br>264600,<br>278300,<br>600890,<br>600890,<br>601071,<br>602134 |
| HSIFH48 | 721310 | 376 | 101 - 448 | 1636 | Ser-1 to Ser-8,<br>Pro-22 to Cys-30.   | L0803: 4, H0590:<br>3, L0774: 3, S0380:<br>3, L0748: 2, L0771:<br>1, L0809: 1, L0789:<br>1, L0743: 1 and<br>L0779: 1. |      |   |
| HSIFN66 | 742966 | 377 | 2 - 211   | 1637 | Asp-6 to Asp-18.                       | H0590: 2  |      |   |
| HSIFP22 | 674018 | 378 | 2 - 223   | 1638 | Ala-12 to Gly-25,<br>Pro-51 to Glu-62. | H0036: 2 and<br>H0590: 2.   |      |   |
| HSIFR56 | 733024 | 379 | 151 - 330 | 1639 | Pro-8 to Pro-13.                       | H0590: 2  |      |   |
| HSIFS23 | 919109 | 380 | 3 - 299   | 1640 | Pro-15 to Glu-20,<br>Trp-78 to Gly-88. | H0590: 3  |      |   |
| HSIFV95 | 836996 | 381 | 155 - 496 | 1641 | Gly-5 to Asp-11,<br>Gln-26 to Arg-32.  | H0590: 1, L0591:<br>1 and H0506: 1.   |      |   |
| HSIFW89 | 771820 | 382 | 194 - 307 | 1642 |  | H0590: 2  |      |   |
| HSIFW94 | 765203 | 383 | 70 - 309  | 1643 | Arg-13 to Ser-19.                      | H0590: 2  |      |   |
| HSIFX92 | 968352 | 384 | 83 - 193  | 1644 |  | L0534: 1, H0036:<br>1 and H0590: 1.   |      |   |

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| HSIFZ21 | 670415 | 385 | 72 - 263  | 1645 | Arg-7 to Ser-17.   | H0590: 2, L0109: 1 and H0622: 1. |  |  |
| HSIFZ51 | 919096 | 386 | 51 - 230  | 1646 | His-12 to Trp-17, Val-25 to Glu-36.  | H0590: 3                         |  |  |
| HSIGA08 | 866568 | 387 | 1 - 282   | 1647 | Trp-1 to Gly-22, Pro-24 to Pro-30, Ser-43 to Ser-51.   | H0590: 2                         |  |  |
| HSIGA28 | 686047 | 388 | 11 - 274  | 1648 | Thr-1 to Pro-12, Leu-26 to Gln-31, Ser-41 to His-46.   | H0590: 2 and L0562: 1.           |  |  |
| HSIGA33 | 701963 | 389 | 1 - 186   | 1649 | Cys-8 to Arg-17.   | H0590: 2                         |  |  |
| HSIGD07 | 952508 | 390 | 220 - 324 | 1650 | Arg-15 to Ile-21.  | H0590: 1 and H0598: 1.           |  |  |
| HSIGD94 | 961040 | 391 | 72 - 200  | 1651 |  | H0036: 1 and H0590: 1.           |  |  |
| HSIGF11 | 866552 | 392 | 3 - 143   | 1652 |  | H0590: 3                         |  |  |
| HSIGG58 | 735682 | 393 | 1 - 279   | 1653 |  | H0590: 2                         |  |  |
| HSIGG95 | 795631 | 394 | 130 - 291 | 1654 |  | H0590: 2                         |  |  |
| HSIGH52 | 726384 | 395 | 1 - 234   | 1655 | Arg-13 to Gly-18.  | H0590: 2                         |  |  |
| HSIGJ45 | 718728 | 396 | 3 - 167   | 1656 | Ser-1 to Glu-8, Glu-21 to Glu-26.  | H0590: 2                         |  |  |
| HSIGL56 | 906942 | 397 | 390 - 88  | 1657 | Lys-10 to Asn-15, Thr-17 to Glu-22, Lys-38 to Gln-49, Leu-54 to Gly-59, Ala-62 to Ser-70, His-95 to Pro-101. | H0036: 1, H0590: 1 and L0599: 1. |  |  |
| HSIGL94 | 769754 | 398 | 53 - 166  | 1658 | Gly-25 to Pro-33.  | H0590: 2                         |  |  |

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| HSIGM43 | 716259 | 399 | 72 - 278  | 1659 | Arg-37 to Gln-42.                      | H0590: 2                  |  |
| HSIGM67 | 751278 | 400 | 2 - 163   | 1660 | Gln-1 to Gln-7,<br>Trp-21 to Lys-28.   | H0590: 2                  |  |
| HSIGO07 | 893712 | 401 | 185 - 57  | 1661 |  | H0590: 2                  |  |
| HSIGO67 | 751262 | 402 | 1 - 408   | 1662 | Arg-11 to Pro-16.                      | H0590: 2                  |  |
| HSOAT94 | 537505 | 403 | 72 - 152  | 1663 |  | H0343: 2                  |  |
| HSOAW33 | 702709 | 404 | 117 - 278 | 1664 |  | H0343: 1 and<br>H0595: 1. |  |
| HSOAW39 | 866228 | 405 | 26 - 139  | 1665 |  | H0343: 2                  |  |
| HSOBF59 | 738861 | 406 | 63 - 218  | 1666 | Met-1 to Ser-12,<br>Tyr-20 to Phe-26.  | H0595: 2                  |  |
| HSOBF65 | 747484 | 407 | 87 - 269  | 1667 |  | H0595: 2                  |  |
| HSOBL03 | 923317 | 408 | 100 - 288 | 1668 | Lys-34 to Trp-44.                      | H0595: 2                  |  |
| HSOBL58 | 735589 | 409 | 187 - 321 | 1669 |  | H0595: 2                  |  |
| HSOBL59 | 738858 | 410 | 2 - 130   | 1670 | Arg-1 to Gly-7,<br>Lys-32 to Cys-41.   | H0595: 2                  |  |
| HSOBP77 | 771729 | 411 | 1 - 189   | 1671 |  | H0595: 2                  |  |
| HSOBQ06 | 934666 | 412 | 269 - 379 | 1672 | Thr-30 to Lys-37.                      | H0595: 2                  |  |
| HSOBQ14 | 719796 | 413 | 3 - 134   | 1673 |  | H0595: 2                  |  |
| HSOBQ82 | 779093 | 414 | 109 - 288 | 1674 |  | H0595: 2                  |  |
| HSOBZ60 | 739915 | 415 | 115 - 210 | 1675 | Lys-27 to Lys-32.                      | H0595: 2                  |  |
| HSODB93 | 785711 | 416 | 288 - 416 | 1676 | Pro-23 to Cys-29,<br>Glu-35 to Ile-41. | H0343: 1 and<br>H0595: 1. |  |
| HSODO56 | 835876 | 417 | 64 - 159  | 1677 | Tyr-1 to Arg-7,<br>Gln-24 to Lys-29.   | H0590: 1 and<br>H0595: 1. |  |
| HSODT01 | 915544 | 418 | 41 - 277  | 1678 |  | H0595: 2                  |  |
| HSODZ10 | 963671 | 419 | 24 - 368  | 1679 | Asn-12 to Leu-18,<br>Lys-52 to Lys-59. | H0595: 2                  |  |

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|         |        |     |           |      |  | Leu-69 to Pro-74,<br>Pro-85 to Lys-107.   |  |  |  |
| HSODZ58 | 731545 | 420 | 3 - 311   | 1680 |  | Thr-95 to Phe-101.  |  | H0539: 1, L0749:<br>1 and H0595: 1.                          |  |
| HSEOC07 | 952397 | 421 | 66 - 200  | 1681 |  | Ser-11 to His-16.   |  | H0343: 1 and<br>H0595: 1.                                    |  |
| HSPAF44 | 761986 | 422 | 184 - 387 | 1682 |  | Val-58 to Tyr-64.   |  | H0478: 3   |  |
| HSPAK46 | 968901 | 423 | 9 - 440   | 1683 |  | Pro-1 to Gly-11,<br>Arg-43 to Arg-57,<br>Ser-64 to Gly-69,<br>Arg-74 to Thr-79. |  | H0478: 2   |  |
| HSPAL44 | 754600 | 424 | 100 - 225 | 1684 |  |   |  | H0478: 2 and<br>L0758: 1.                                    |  |
| HSPAM95 | 918857 | 425 | 1 - 120   | 1685 |  |   |  | H0478: 2   |  |
| HSPAP89 | 775813 | 426 | 280 - 558 | 1686 |  |   |  | H0478: 1 and<br>H0595: 1.                                    |  |
| HSPAQ91 | 789887 | 427 | 136 - 429 | 1687 |  |   |  | H0539: 1 and<br>H0478: 1.                                    |  |
| HSPBG79 | 771630 | 428 | 52 - 399  | 1688 |  | Gln-12 to Lys-18.   |  | H0478: 2   |  |
| HSPBL63 | 727687 | 429 | 435 - 674 | 1689 |  | Ser-16 to Gly-27.   |  | H0478: 3 and<br>S0392: 1.                                    |  |
| HSPBM18 | 786056 | 430 | 185 - 334 | 1690 |  |   |  | H0478: 3 and<br>S0392: 1.                                    |  |
| HSPME73 | 915722 | 431 | 46 - 798  | 1691 |  | Pro-21 to Ile-28,<br>Ile-32 to Phe-39,<br>Pro-71 to Leu-82.                     |  | AR089: 3, AR061:<br>2<br>S0370: 1, H0479:<br>1 and L0439: 1. |  |
| HSPMG03 | 920267 | 432 | 290 - 508 | 1692 |  | Lys-1 to Glu-11,  |  | H0478: 2 and   |  |

|          |        |     |           |      |   |                                     |  |  |
|----------|--------|-----|-----------|------|---|-------------------------------------|--|--|
| HTNTD72  | 870030 | 433 | 3 - 302   | 1693 | Met-24 to Ala-29,<br>Pro-60 to Glu-66.                    | H0479: 1.                           |  |  |
| HTPAA30  | 509812 | 434 | 7 - 99    | 1694 | Leu-14 to Trp-29.   | L0518: 1, S0378:<br>1 and S0446: 1. |  |  |
| HTPAC06  | 960791 | 435 | 1 - 159   | 1695 |   | H0039: 2                            |  |  |
| HTPAF01  | 961063 | 436 | 228 - 347 | 1696 |   | H0039: 2                            |  |  |
| HTPAG78  | 773936 | 437 | 228 - 386 | 1697 |   | H0039: 2                            |  |  |
| HTPBH46  | 522888 | 438 | 179 - 313 | 1698 |   | H0039: 2                            |  |  |
| HTPBQ47  | 922777 | 439 | 184 - 444 | 1699 |   | H0622: 2 and<br>H0039: 1.           |  |  |
| HTPBT55  | 509264 | 440 | 75 - 221  | 1700 | Ser-19 to Gln-35.   | H0039: 2                            |  |  |
| HTPCD84  | 783263 | 441 | 13 - 90   | 1701 | Glu-1 to Ser-7,<br>His-13 to Ala-19,<br>Gly-21 to Arg-26. | H0039: 2                            |  |  |
| HTPCCK55 | 732458 | 442 | 30 - 104  | 1702 |   | H0039: 2                            |  |  |
| HTPCN85  | 529760 | 443 | 3 - 221   | 1703 |   | H0039: 2                            |  |  |
| HTPCO32  | 973306 | 444 | 209 - 316 | 1704 | Arg-7 to Arg-14.  | H0039: 3                            |  |  |
| HTPCR51  | 526406 | 445 | 115 - 228 | 1705 |   | H0039: 2                            |  |  |
| HTPCS70  | 529766 | 446 | 3 - 323   | 1706 | Asn-7 to Gly-12,<br>Ser-29 to Ser-37.                     | H0039: 2, H0622:<br>2 and S0380: 1. |  |  |
| HTPCT55  | 592481 | 447 | 1 - 342   | 1707 | Gly-1 to Pro-19,<br>Ala-45 to Thr-61.                     | H0039: 2                            |  |  |
| HTPCT67  | 573704 | 448 | 113 - 346 | 1708 | Gln-16 to His-25,<br>Pro-27 to Ser-32.                    | H0039: 2, L0754:<br>1 and L0780: 1. |  |  |
| HTPCT82  | 869886 | 449 | 3 - 248   | 1709 | Thr-44 to Gln-49.   | H0039: 2                            |  |  |
| HTPCV62  | 573698 | 450 | 1 - 297   | 1710 | Lys-1 to Met-10,<br>Met-28 to Gly-38.                     | H0039: 2                            |  |  |

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|---------|--------|-----|-----------|------|--|--|---|---|------|--|--|
|         |        |     |           |      |  |  | Lys-57 to Arg-65,<br>Pro-73 to Gly-88.  |   |      |  |  |
| HTPCV73 | 573686 | 451 | 199 - 384 | 1711 |  |  |   | H0039: 2  |      |  |  |
| HTPCW69 | 935946 | 452 | 176 - 373 | 1712 |  |  |   | H0039: 3  |      |  |  |
| HTPCZ07 | 953769 | 453 | 3 - 143   | 1713 |  |  | Ile-10 to Arg-18,<br>Asn-22 to Ser-27,<br>Ile-35 to Asn-40.                     | H0039: 2  |      |  |  |
| HTPDI16 | 830553 | 454 | 3 - 197   | 1714 |  |  |   | H0039: 2  |      |  |  |
| HTPDJ03 | 924789 | 455 | 193 - 426 | 1715 |  |  | Gly-12 to Arg-18,<br>Asn-20 to Trp-26,<br>Pro-68 to Ser-78.                     | H0039: 2  |      |  |  |
| HTPDJ94 | 669158 | 456 | 10 - 258  | 1716 |  |  | Ser-4 to Leu-13,<br>Ala-15 to Phe-28,<br>Val-53 to His-59,<br>Gln-72 to Lys-82. | H0039: 2  | 9q34 | 125270,<br>125270,<br>128100,<br>137350,<br>191100,<br>215700,<br>223360,<br>268900,<br>601850 |  |
| HTPDK32 | 699457 | 457 | 57 - 257  | 1717 |  |  |   | L0790: 2, H0039:<br>1, L0598: 1, L0639:<br>1, L0438: 1 and<br>S0330: 1. |      |  |  |
| HTPDS34 | 526416 | 458 | 222 - 404 | 1718 |  |  |   | H0039: 2  |      |  |  |
| HTPDS85 | 541837 | 459 | 2 - 124   | 1719 |  |  | Gln-27 to Lys-41.   | H0039: 2  |      |  |  |
| HTPDT70 | 573727 | 460 | 2 - 118   | 1720 |  |  | Gln-1 to Phe-8.   | H0039: 2  |      |  |  |
| HTPDU59 | 973279 | 461 | 89 - 283  | 1721 |  |  | Asn-10 to Glu-29,   | H0039: 3  |      |  |  |

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|---------|--------|-----|-----------|------|--|-------------------------------------|------|--|
| HTPDV73 | 912947 | 462 | 276 - 752 | 1722 | Ser-34 to Gln-49.<br>Asp-14 to Ile-20.   | AR089: 0, AR061:<br>0<br>H0039: 2   |      |  |
| HTPDW56 | 573706 | 463 | 1 - 99    | 1723 | Gly-1 to Arg-6,<br>Arg-13 to Ser-33.   | H0039: 2                            |      |  |
| HTPDW62 | 965356 | 464 | 170 - 337 | 1724 | Ser-40 to Ser-47.  | H0039: 2, S0358:<br>1 and L0764: 1. |      |  |
| HTPDZ94 | 660751 | 465 | 155 - 343 | 1725 |  | H0039: 2                            |      |  |
| HTPEH20 | 573667 | 466 | 231 - 392 | 1726 | Glu-5 to Phe-14.   | H0039: 2 and<br>L0758: 1.           |      |  |
| HTPFA05 | 869865 | 467 | 53 - 271  | 1727 |  | H0622: 2                            |      |  |
| HTPFD02 | 974295 | 468 | 61 - 354  | 1728 |  | H0622: 5                            |      |  |
| HTPFI35 | 874323 | 469 | 3 - 404   | 1729 | Glu-7 to Tyr-12,<br>Phe-14 to Asn-19,<br>Glu-22 to Ser-28,<br>Glu-36 to Ser-43,<br>Ser-68 to Arg-73. | S0356: 2, H0622:<br>2 and L0766: 1. |      |  |
| HTPFJ95 | 933120 | 470 | 271 - 402 | 1730 | Asp-23 to Arg-28.  | H0622: 2 and<br>H0039: 1.           |      |  |
| HTPFM01 | 914956 | 471 | 99 - 284  | 1731 | Gln-1 to Ile-7.  | H0622: 2                            |      |  |
| HTPFM04 | 926728 | 472 | 146 - 433 | 1732 | Ile-35 to Tyr-42,<br>Val-50 to Ala-55.   | H0039: 1 and<br>H0622: 1.           |      |  |
| HTPFN90 | 926462 | 473 | 3 - 218   | 1733 |  | H0622: 2                            |      |  |
| HTPFQ07 | 869785 | 474 | 3 - 212   | 1734 | Pro-32 to Pro-41,<br>Pro-59 to Gly-70.   | H0622: 8                            | 6p21 | 180297,<br>248611,<br>251000,<br>263200, |

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|         |        |     |           |      |  |   |  |  | 600211,<br>600701,<br>601690 |
| HTPFS01 | 914908 | 475 | 2 - 325   | 1735 |  | Cys-2 to Thr-16,<br>Pro-63 to Gly-68,<br>Pro-89 to Gly-102. | H0039: 1 and<br>H0622: 1.                                  |  |                              |
| HTPFW04 | 926537 | 476 | 94 - 252  | 1736 |  | Ser-12 to Pro-17.   | H0622: 2   |  |                              |
| HTPFX77 | 961059 | 477 | 7 - 138   | 1737 |  | Lys-16 to Thr-21,<br>Phe-25 to Phe-34.                      | H0622: 3 and<br>H0039: 1.                                  |  |                              |
| HTPFY31 | 869839 | 478 | 19 - 150  | 1738 |  |   | H0622: 2, L0623:<br>1, L0803: 1, L0527:<br>1 and L0759: 1. |  |                              |
| HTPFY43 | 869844 | 479 | 183 - 368 | 1739 |  |   | H0622: 2 and<br>L0751: 1.                                  |  |                              |
| HTPFY73 | 906905 | 480 | 293 - 502 | 1740 |  | Glu-23 to Ile-32.   | H0039: 2, H0622:<br>2 and L0369: 1.                        |  |                              |
| HTPFZ03 | 922755 | 481 | 168 - 425 | 1741 |  | His-1 to Asp-6,<br>Arg-28 to Arg-33.                        | H0622: 3 and<br>H0039: 1.                                  |  |                              |
| HTPGD19 | 869842 | 482 | 160 - 555 | 1742 |  | Pro-14 to Ser-20,<br>His-35 to Leu-40.                      | H0622: 3   |  |                              |
| HTPGE28 | 974302 | 483 | 318 - 635 | 1743 |  | Lys-13 to Asn-18.   | H0622: 4 and<br>H0039: 1.                                  |  |                              |
| HTPGF79 | 974301 | 484 | 323 - 442 | 1744 |  |   | H0622: 2 and<br>H0539: 1.                                  |  |                              |
| HTPGG12 | 969538 | 485 | 245 - 541 | 1745 |  |   | H0622: 4 and<br>H0039: 1.                                  |  |                              |
| HTPGK10 | 963169 | 486 | 1 - 189   | 1746 |  | Gly-1 to Val-7,<br>Thr-9 to Pro-15,                         | H0622: 2   |  |                              |



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|---------|--------|-----|-----------|------|--|--|--|--|---------|--|
|         |        |     |           |      |  |  | Leu-27 to Tyr-32,<br>Pro-44 to Lys-57.                     |  |         |  |
| HTPGL49 | 974015 | 487 | 84 - 359  | 1747 |  |  | Ala-48 to Ala-64.  | H0622: 4   |         |  |
| HTPGR61 | 869802 | 488 | 99 - 317  | 1748 |  |  | Lys-1 to Pro-7,<br>Pro-14 to Lys-25.                       | H0622: 2, L0750:<br>1 and S0434: 1.                |         |  |
| HTPGW12 | 969522 | 489 | 1 - 192   | 1749 |  |  | Asp-1 to Gln-13,<br>Gln-39 to Glu-44,<br>Asp-52 to Val-64. | AR061: 8, AR089:<br>3<br>H0039: 1 and<br>H0622: 1. |         |  |
| HTPHD53 | 869795 | 490 | 47 - 400  | 1750 |  |  | Gln-10 to Phe-18,<br>Pro-58 to Gly-67.                     | H0622: 3   |         |  |
| HTPHE36 | 869814 | 491 | 385 - 600 | 1751 |  |  | Gly-6 to Asn-11.   | H0622: 2   |         |  |
| HTPHG90 | 914955 | 492 | 1 - 120   | 1752 |  |  | Arg-13 to Ala-18,<br>Pro-33 to Glu-39.                     | H0622: 3   |         |  |
| HTPHI08 | 958077 | 493 | 2 - 355   | 1753 |  |  | Asn-6 to Glu-13,<br>Tyr-23 to Trp-30,<br>Ser-38 to Cys-43. | H0039: 2 and<br>H0622: 1.                          |         |  |
| HTPHK06 | 975310 | 494 | 242 - 42  | 1754 |  |  | Gly-24 to Val-29.  | H0622: 3   |         |  |
| HTPHR76 | 869791 | 495 | 3 - 227   | 1755 |  |  |  | L0777: 2, H0622:<br>1, S0374: 1 and<br>L0749: 1.   |         |  |
| HTPHS37 | 960637 | 496 | 3 - 338   | 1756 |  |  |  | H0039: 1 and<br>H0622: 1.                          |         |  |
| HTPHT28 | 952088 | 497 | 77 - 259  | 1757 |  |  |  | H0622: 2 and<br>L0665: 1.                          |         |  |
| HTPHV17 | 926455 | 498 | 38 - 172  | 1758 |  |  |  | H0622: 2   |         |  |
| HTPIC25 | 975319 | 499 | 1 - 462   | 1759 |  |  | Pro-59 to Lys-64.  | H0622: 4   |         |  |
| HTPIE48 | 911422 | 500 | 2 - 313   | 1760 |  |  | Pro-23 to Gly-33,  | H0622: 3 and<br>19p13.3                            | 108725, |  |

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|         |        |     |           |      | Arg-42 to Gly-50,<br>Asn-54 to Glu-59.                     | H0039: 1.   |  | 120700,<br>133171,<br>136836,<br>145981,<br>147141,<br>164953,<br>188070,<br>600957,<br>601238,<br>601846,<br>602216,<br>602477 |
| HUFAA81 | 777951 | 501 | 224 - 442 | 1761 | Asp-1 to Glu-8.  | H0506: 2  |  |   |
| HUFAC65 | 750264 | 502 | 3 - 203   | 1762 | Ile-52 to His-63.  | H0506: 2  |  |   |
| HUFAG81 | 966223 | 503 | 2 - 178   | 1763 | Ser-1 to Gly-11,<br>Arg-16 to Cys-22,<br>Pro-29 to Arg-34. | S0356: 1 and<br>H0506: 1.   |  |   |
| HUFAJ29 | 690591 | 504 | 3 - 185   | 1764 | Pro-4 to Gly-13.   | H0506: 2  |  |   |
| HUFAL90 | 788868 | 505 | 3 - 128   | 1765 | Pro-34 to Pro-42.  | H0506: 2  |  |   |
| HUFAN64 | 678677 | 506 | 39 - 221  | 1766 | His-1 to Phe-11,<br>Pro-33 to Gly-39.                      | H0331: 1 and<br>H0506: 1.   |  |   |
| HUFAP02 | 919805 | 507 | 355 - 468 | 1767 | Ile-1 to Thr-15.   | H0506: 2  |  |   |
| HUFAU25 | 678024 | 508 | 1 - 309   | 1768 | Gln-5 to Gly-15.   | AR089: 2, AR061:<br>1<br>L0794: 5, S0450:<br>1, L0662: 1, L0768:<br>1, L0790: 1, L0748:<br>1, L0439: 1, L0596:<br>1 and H0506: 1. |  |   |

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|----------|--------|-----|------------|------|---|---|--|--|
| HUFBA27  | 966256 | 509 | 1 - 219    | 1769 |   | H0595: 1 and<br>H0506: 1.   |  |  |
| HUFBN27  | 868997 | 510 | 42 - 401   | 1770 | Thr-9 to Asn-15,<br>Arg-44 to Phe-50.   | H0598: 1 and<br>H0506: 1.   |  |  |
| HUFBU14  | 868993 | 511 | 116 - 469  | 1771 | Gly-1 to Ser-7,<br>Gln-12 to Asp-19.    | H0506: 2  |  |  |
| HUFBU41  | 712256 | 512 | 276 - 464  | 1772 | Glu-10 to Leu-16,<br>Thr-18 to Asp-27.  | H0506: 2  |  |  |
| HUFBU61  | 741770 | 513 | 10 - 180   | 1773 | Thr-11 to Asn-20,<br>Pro-47 to Asn-52.  | H0506: 2  |  |  |
| HUFBV27  | 683030 | 514 | 8 - 286    | 1774 |   | H0506: 2  |  |  |
| HUFDDB55 | 950430 | 515 | 2169 - 553 | 1775 |   | AR050:10, AR054:<br>8, AR051: 2,<br>AR089: 2, AR061:<br>0, S0358: 2,<br>L0769: 2, L0646: 2,<br>L0764: 2, S0404: 2,<br>S0406: 2, S0408: 1,<br>H0085: 1, H0204:<br>1, H0597: 1, L0794:<br>1, L0776: 1, L0518:<br>1, L0789: 1 and<br>L0596: 1. |  |  |
| HUFGH78  | 659722 | 516 | 2 - 340    | 1776 | Gln-19 to Arg-24.                       | S0360: 2, H0590:<br>2, S0358: 1, H0510:<br>1, H0509: 1 and<br>H0506: 1.   |  |  |
| HUVDJ10  | 886207 | 517 | 573 - 953  | 1777 | Asn-18 to Gln-26,<br>Arg-95 to Glu-107. | S0358: 45, S0354:<br>22, H0590: 8,  |  |  |

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|         |        |      |           |      |                                      |  | S0374: 7, H0036: 5,<br>S0404: 4, H0623: 3,<br>H0170: 2, S0356: 2,<br>S0444: 2, H0085: 2,<br>H0231: 2, H0056:<br>2, L0764: 2, H0171:<br>1, S0376: 1, S0408:<br>1, H0263: 1, L0040:<br>1, H0232: 1,<br>H0597: 1, H0494:<br>1, L0627: 1, L0765:<br>1, L0777: 1, L0731:<br>1 and H0506: 1. |  |  |
| HVAE01  | 961825 | 1262 | 526 - 326 | 2522 |                                      |  | L0439: 2, H0675:<br>1, L0763: 1, L0772:<br>1, L0606: 1, L0666:<br>1, L0438: 1, S0378:<br>1, L0748: 1, L0745:<br>1, L0750: 1 and<br>L0594: 1.   |  |  |
| HVAAE94 | 968675 | 519  | 95 - 244  | 1779 | Ser-27 to Pro-32.                    |  | S0378: 2   |  |  |
| HVACL61 | 868572 | 520  | 243 - 524 | 1780 | Arg-4 to Ala-9,<br>Gln-12 to Asn-18. |  | H0510: 2, S0378:<br>1, L0740: 1 and<br>L0777: 1.   |  |  |
| HVAEM04 | 940469 | 521  | 19 - 93   | 1781 |                                      |  | S0358: 1 and<br>S0378: 1.  |  |  |
| HVAET61 | 965365 | 522  | 438 - 698 | 1782 | Ile-1 to Asn-8.                      |  | AR089: 74,<br>AR061: 66  |  |  |

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| HVAFD06 | 933527 | 523 | 300 - 629 | 1783 | Asp-6 to Ala-12,<br>Asn-14 to Pro-19.                        |  |  | S0378: 2   |  |  |  |
| HVAHA06 | 933531 | 524 | 25 - 249  | 1784 |  |  |  | S0378: 2 and<br>L0581: 1.  |  |  |  |
| HVAME35 | 968676 | 525 | 621 - 965 | 1785 | Thr-14 to Gln-22,<br>Ala-52 to Gly-70,<br>Cys-94 to Thr-103. |  |  | S0378: 6 and<br>S0380: 3.  |  |  |  |
| HVAMW07 | 951733 | 526 | 1 - 405   | 1786 | Pro-4 to Arg-16.   |  |  | S0380: 2   |  |  |  |
| HVAND08 | 958443 | 527 | 2 - 376   | 1787 | Arg-10 to Ser-23.  |  |  | S0408: 1 and<br>S0380: 1.  |  |  |  |
| HVANR45 | 930308 | 528 | 151 - 606 | 1788 | Arg-45 to Asp-50,<br>Pro-111 to Gly-118.                     |  |  | S0380: 66, S0378:<br>64, S0368: 6,<br>L0758: 3, L0778: 2,<br>T0023: 1, L0794: 1<br>and L0790: 1. |  |  |  |
| HVAOG11 | 966135 | 529 | 226 - 861 | 1789 | Asn-16 to Ser-23,<br>Lys-53 to Asp-60.                       |  |  | AR089: 2, AR061:<br>1, H0014: 1,<br>H0039: 1, S0380: 1<br>and L0740: 1.                          |  |  |  |
| HVAOK04 | 925932 | 530 | 50 - 178  | 1790 | Gln-1 to Ser-6,<br>Ser-16 to Gln-25,<br>Ser-35 to Lys-43.    |  |  | S0380: 3 and<br>L0779: 1.  |  |  |  |
| HVAOW86 | 965298 | 531 | 69 - 440  | 1791 | Ser-21 to Tyr-26.  |  |  | L0740: 5, S0328:<br>2, L0748: 2, L0646:<br>1, L0387: 1, L0803:<br>1, L0804: 1, L0774:            |  |  |  |

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|         |        |     |           |      |  |  |   | 1, L0809: 1, S0380: 1, L0754: 1 and L0752: 1.                  |   |  |  |
| HVARE86 | 965243 | 532 | 379 - 501 | 1792 |  |  | Val-4 to Val-13, Pro-21 to Gly-40.                    | S0380: 4, L0757: 2, S0360: 1, L0021: 1, L0803: 1 and L0663: 1. |   |  |  |
| HWCAG91 | 773364 | 533 | 71 - 247  | 1793 |  |  |   | S0294: 3, L0766: 2 and H0085: 1.                               |   |  |  |
| HWGAC19 | 668126 | 534 | 311 - 421 | 1794 |  |  |   | S0370: 2   |   |  |  |
| HWGAC45 | 754792 | 535 | 3 - 206   | 1795 |  |  |   | S0370: 2   | 8 |  |  |
| HWGAE55 | 974955 | 536 | 2 - 286   | 1796 |  |  | Ser-4 to Asp-15, Ser-28 to Gly-33, Trp-36 to Trp-46.  | S0370: 4 and S0374: 1.   |   |  |  |
| HWGQD52 | 726390 | 537 | 1 - 111   | 1797 |  |  |   | S0382: 2   |   |  |  |
| HWGQF79 | 882611 | 538 | 1 - 366   | 1798 |  |  | Lys-3 to Gly-11.                                      | AR089: 40, AR061: 16, S0372: 1 and S0382: 1.                   |   |  |  |
| HWLAL74 | 761974 | 539 | 26 - 166  | 1799 |  |  | Arg-34 to Thr-40.                                     | S0374: 2   |   |  |  |
| HWLBI74 | 839518 | 540 | 210 - 380 | 1800 |  |  | Pro-35 to Gly-43.                                     | S0374: 2   |   |  |  |
| HWLBJ06 | 934614 | 541 | 16 - 180  | 1801 |  |  |   | S0360: 1, S0374: 1 and L0777: 1.                               |   |  |  |
| HWLBK76 | 731099 | 542 | 8 - 163   | 1802 |  |  |   | S0374: 2 and L0604: 1.   |   |  |  |
| HWLBK80 | 933865 | 543 | 116 - 547 | 1803 |  |  | Glu-11 to Gly-16, Gln-28 to Phe-44, Pro-59 to Asp-68, | AR089: 7, AR061: 2 S0374: 2                                    |   |  |  |

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| HWLCV54 | 929742 | 544 | 98 - 247  | 1804 | Arg-73 to Gly-80,<br>Arg-1 to Asn-12,<br>Asn-41 to Tyr-47.  | S0374: 2 and<br>H0316: 1.  |  |  |
| HWLDO22 | 838721 | 545 | 41 - 205  | 1805 | Arg-40 to Thr-46.   | L0774: 3, L0803:<br>2, S0374: 2, S0354:<br>1, S0358: 1, H0270:<br>1, H0036: 1 and<br>L0758: 1. |  |  |
| HWLED58 | 830330 | 546 | 169 - 444 | 1806 | Ser-1 to Arg-11,<br>Ser-22 to Ala-33.   | S0354: 3   |  |  |
| HWLEF86 | 785193 | 547 | 152 - 3   | 1807 |   | S0354: 2   |  |  |
| HWLEH06 | 934649 | 548 | 187 - 555 | 1808 | Glu-1 to Leu-6,<br>Lys-37 to Gly-49,<br>Arg-80 to Gly-87,<br>Arg-92 to Ala-97.  | S0354: 2   |  |  |
| HWLEH47 | 709376 | 549 | 1 - 258   | 1809 |   | H0590: 3, S0354:<br>1 and H0506: 1.  |  |  |
| HWLEI16 | 729050 | 550 | 163 - 318 | 1810 | Ser-15 to Asp-25.   | S0354: 2   |  |  |
| HWLEJ07 | 952396 | 551 | 49 - 252  | 1811 | Val-49 to Leu-56.   | S0354: 2   |  |  |
| HWLEK39 | 918545 | 552 | 3 - 371   | 1812 | Arg-35 to Glu-40,<br>Pro-44 to Arg-52.  | S0354: 2   |  |  |
| HWLEN08 | 958509 | 553 | 2 - 808   | 1813 | Arg-1 to Asp-6,<br>Glu-35 to Cys-59,<br>Glu-62 to Leu-69,<br>Arg-72 to Lys-89,<br>Leu-97 to Phe-104,<br>Val-108 to Lys-135,<br>Gln-141 to Lys-149,<br>Ile-156 to Ser-163, | S0354: 2   |  |  |

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| HWLEN20 | 963418 | 554 | 105 - 311 | 1814 | Lys-173 to Gly-206,<br>Gly-235 to Gly-247.                    | S0354: 6                            |  |  |
| HWLEO59 | 974078 | 555 | 3 - 212   | 1815 | Gly-6 to Gly-11,<br>Glu-17 to Leu-24,<br>Pro-44 to Thr-49.    | S0354: 11                           |  |  |
| HWLEP95 | 751199 | 556 | 161 - 445 | 1816 | Lys-1 to Gly-7,<br>Ala-21 to Ser-26,<br>Arg-61 to Ala-66.     | S0354: 2                            |  |  |
| HWLEQ36 | 966250 | 557 | 68 - 256  | 1817 | Ala-17 to Val-34,<br>Arg-36 to Pro-45.                        | S0354: 2                            |  |  |
| HWLEQ81 | 934224 | 558 | 70 - 222  | 1818 | Leu-1 to Ser-11,<br>Asp-29 to Thr-35,<br>Ser-44 to Ser-56.    | S0354: 2                            |  |  |
| HWLER88 | 915168 | 559 | 21 - 143  | 1819 | Glu-1 to Lys-15,<br>Gln-17 to Ser-22.                         | S0354: 2                            |  |  |
| HWLFB08 | 849136 | 560 | 2 - 520   | 1820 | Lys-11 to His-23.   | S0354: 2                            |  |  |
| HWLFC80 | 830279 | 561 | 180 - 311 | 1821 | Glu-10 to Leu-24,<br>Lys-42 to Ala-48,<br>Thr-105 to Ser-114. | S0354: 2 and<br>S0358: 1.           |  |  |
| HWLFE50 | 830283 | 562 | 419 - 592 | 1822 | Gly-34 to Arg-44.   | S0354: 3, L0515:<br>1 and L0779: 1. |  |  |
| HWLFF40 | 830287 | 563 | 1 - 102   | 1823 | Asn-2 to Phe-7.   | S0354: 3                            |  |  |
| HWLFF62 | 915155 | 564 | 85 - 420  | 1824 | Gln-22 to Pro-29,<br>Pro-39 to Pro-44.                        | S0354: 2                            |  |  |
| HWLFH47 | 719752 | 565 | 30 - 167  | 1825 |   | S0354: 2                            |  |  |
| HWLFJ51 | 853602 | 566 | 79 - 210  | 1826 |   | S0354: 3                            |  |  |



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| HWLFK50 | 918539 | 567 | 150 - 302 | 1827 |   | S0354: 2                            |  |
| HWLFO70 | 756554 | 568 | 167 - 397 | 1828 |   | S0354: 2                            |  |
| HWLFO82 | 779461 | 569 | 253 - 429 | 1829 | Arg-22 to Glu-29.   | S0354: 2                            |  |
| HWLFO92 | 791052 | 570 | 3 - 137   | 1830 |   | S0354: 2                            |  |
| HWLFP37 | 708985 | 571 | 125 - 436 | 1831 | Lys-63 to Ser-69.   | S0354: 2                            |  |
| HWLFP46 | 882848 | 572 | 2 - 235   | 1832 | Thr-21 to Lys-32,<br>Val-68 to Gly-77.                      | S0354: 2                            |  |
| HWLFQ48 | 721154 | 573 | 77 - 211  | 1833 |   | S0354: 2                            |  |
| HWLFS01 | 915531 | 574 | 192 - 374 | 1834 |   | S0354: 2                            |  |
| HWLFS86 | 830246 | 575 | 393 - 557 | 1835 |   | S0354: 4                            |  |
| HWLFW61 | 922924 | 576 | 1 - 147   | 1836 |   | S0354: 2                            |  |
| HWLFW01 | 915527 | 577 | 105 - 515 | 1837 | Thr-25 to Gln-30,<br>Ser-37 to Ile-43.                      | S0354: 2                            |  |
| HWLGL36 | 806724 | 578 | 295 - 429 | 1838 |   | S0354: 2                            |  |
| HWLGP10 | 883139 | 579 | 37 - 318  | 1839 | Ser-40 to Pro-46,<br>Lys-51 to Gly-56,<br>Pro-89 to Arg-94. | S0354: 3                            |  |
| HWLGP21 | 958259 | 580 | 2 - 88    | 1840 |   | S0354: 2                            |  |
| HWLGR72 | 958284 | 581 | 73 - 300  | 1841 | Asn-25 to Ser-33.   | S0442: 1 and<br>S0354: 1.           |  |
| HWLGT12 | 966044 | 582 | 36 - 350  | 1842 | Thr-51 to Asp-60,<br>Pro-78 to Thr-89.                      | S0354: 3                            |  |
| HWLGT54 | 952732 | 583 | 534 - 704 | 1843 |   | S0354: 1 and<br>H0509: 1.           |  |
| HWLGV83 | 871680 | 584 | 69 - 308  | 1844 | Pro-40 to His-45.   | S0354: 1, H0574:<br>1 and L0518: 1. |  |
| HWLGX56 | 830329 | 585 | 125 - 394 | 1845 | Thr-42 to Ala-48,<br>Gln-54 to Leu-78,                      | S0354: 6                            |  |

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| HWLHC73 | 830319 | 586 | 365 - 496 | 1846 | Thr-82 to Asn-89.   | S0354: 4  |                               |  |
| HWLHF49 | 926878 | 587 | 3 - 203   | 1847 | Cys-9 to Arg-18.  | S0354: 1 and<br>H0574: 1.   |                               |  |
| HWLHO01 | 915158 | 588 | 2 - 301   | 1848 | Val-2 to Phe-7,<br>Pro-11 to Phe-28,<br>Pro-31 to Gln-59,<br>Glu-72 to Gln-80,<br>Trp-88 to Ser-94. | S0354: 1 and<br>H0539: 1.   |                               |  |
| HWLHP05 | 931087 | 589 | 201 - 389 | 1849 |   | S0354: 2  |                               |  |
| HWLHR93 | 952387 | 590 | 1 - 381   | 1850 | Thr-31 to Trp-36.   | S0354: 2  |                               |  |
| HWLHT06 | 934217 | 591 | 38 - 235  | 1851 | Ile-3 to Leu-11,<br>Leu-27 to Gly-37,<br>Pro-50 to Val-66.  | S0354: 2  |                               |  |
| HWLHT92 | 830322 | 592 | 228 - 458 | 1852 |   | S0354: 3  |                               |  |
| HWLIC75 | 830321 | 593 | 1 - 57    | 1853 | Arg-1 to Gly-8,<br>Lys-14 to Lys-19.  | S0358: 4  |                               |  |
| HWLJF03 | 830233 | 594 | 3 - 167   | 1854 |   | S0358: 8  |                               |  |
| HWLIH21 | 917551 | 595 | 32 - 817  | 1855 |   | S0358: 10, H0263:<br>1 and H0478: 1.                              |                               |  |
| HWLIL65 | 747440 | 596 | 133 - 282 | 1856 | Leu-18 to Lys-30.   | S0358: 2  |                               |  |
| HWLIM37 | 712654 | 597 | 14 - 88   | 1857 | Arg-1 to Cys-7,<br>Arg-12 to Tyr-19.  | S0358: 2, L0766:<br>2, L0757: 2, L0731:<br>1 and L0608: 1.        |                               |  |
| HWLIO73 | 761965 | 598 | 1 - 72    | 1858 |   | S0358: 2  |                               |  |
| HWLIS13 | 933552 | 599 | 118 - 363 | 1859 |   | S0358: 40, S0374: 1q31-q41<br>21, L0803: 14,<br>S0360: 10, S0404: | 134580,<br>145001,<br>145260, |  |

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|         |        |     |           |      |  | 10, S0444: 7,<br>L0664: 6, L0599: 6,<br>S0354: 5, S0376: 5,<br>L0666: 5, L0373: 4,<br>L0662: 4, H0597: 3,<br>L0805: 3, S0328: 3,<br>S0330: 3, L0744: 3,<br>L0040: 2, L0374: 2,<br>L0774: 2, L0776: 2,<br>L0743: 2, S0356: 1,<br>S0442: 1, S0408: 1,<br>H0637: 1, H0596:<br>1, H0231: 1, L0738:<br>1, H0046: 1,<br>H0050: 1, H0674:<br>1, S0370: 1, S0440:<br>1, L0646: 1, L0653:<br>1, L0809: 1, H0648:<br>1, H0672: 1, S0406:<br>1, H0506: 1 and<br>L0600: 1. |            | 150292,<br>208250,<br>226450,<br>276901,<br>600105,<br>600332,<br>600759,<br>600995,<br>601652,<br>601744,<br>601975 |
| HWLIS62 | 722358 | 600 | 148 - 444 | 1860 | His-68 to Arg-74,<br>Ser-79 to Pro-86: | S0358: 2   | Xq12-q13.3 | 300011,<br>300011,<br>300011,<br>300127,<br>305450,<br>309605,<br>313700,<br>313700.                                 |

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| HWLIW68 | 925892 | 601 | 235 - 378 | 1861 |  |   |  | S0358: 2   |   |
| HWLJB04 | 926066 | 602 | 233 - 364 | 1862 |  |   |  | S0358: 2, L0774:<br>1 and L0756: 1.  |   |
| HWLJC30 | 830232 | 603 | 2 - 538   | 1863 |  | Pro-23 to Lys-39,<br>Ser-44 to Leu-74,<br>Lys-77 to Leu-83,<br>Phe-101 to Asn-106,<br>Pro-122 to Trp-130,<br>Asn-151 to Asp-157,<br>Ala-159 to Pro-168. |  | S0358: 3, L0764:<br>2, L0803: 2, S0354:<br>1, H0085: 1, L0646:<br>1, L0775: 1, L0789:<br>1 and L0666: 1. |   |
| HWLJE89 | 928258 | 604 | 460 - 585 | 1864 |  |   |  | S0358: 4   |   |
| HWLJG57 | 849123 | 605 | 240 - 404 | 1865 |  | Ser-26 to Leu-31.   |  | S0358: 3 and<br>L0558: 1.  |   |
| HWLJL14 | 832205 | 606 | 41 - 319  | 1866 |  | Pro-62 to Ser-67,<br>Asn-76 to His-81.  |  | S0358: 1 and<br>H0231: 1.  |   |
| HWLJL46 | 830226 | 607 | 87 - 200  | 1867 |  |   |  | S0358: 6   |   |
| HWLJN54 | 729051 | 608 | 107 - 406 | 1868 |  |   |  | S0358: 7, L0748:<br>3 and H0574: 1.  |   |
| HWLJN66 | 830229 | 609 | 304 - 513 | 1869 |  | Glu-26 to Ser-35.   |  | S0358: 5   |   |
| HWLJP79 | 963698 | 610 | 263 - 445 | 1870 |  | Asp-29 to His-36.   |  | S0358: 3   | 4                                       |
| HWLJR77 | 883207 | 611 | 154 - 660 | 1871 |  | Arg-26 to Arg-41,<br>Val-80 to Asp-86,<br>Ser-102 to Trp-107,<br>Gly-125 to Thr-130.  |  | AR061: 6, AR089:<br>1<br>S0358: 26, S0374:<br>15, S0354: 7,  |   |

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| HWLJX38 | 925868 | 612 | 3 - 86    | 1872 |  |   | S0358: 7   |  |  |  |
| HWLJZ30 | 925870 | 613 | 2 - 400   | 1873 |  | Ile-1 to Cys-9,<br>Asp-13 to Ser-20,<br>Gln-44 to Gly-49,<br>His-116 to Val-121.  | S0358: 4   |  |  |  |
| HWLKC87 | 956205 | 614 | 2 - 133   | 1874 |  | Phe-32 to Arg-38.   | AR089: 5, AR061:<br>3, S0358: 2  |  |  |  |
| HWLKF70 | 830237 | 615 | 103 - 327 | 1875 |  |   | S0358: 3   |  |  |  |
| HWLKL17 | 928720 | 616 | 100 - 273 | 1876 |  | Arg-10 to Asp-15.   | S0358: 2   |  |  |  |
| HWLKR35 | 918557 | 617 | 3 - 521   | 1877 |  | Gly-8 to Lys-15,<br>Ser-20 to Gln-27,<br>Ser-30 to Met-36,<br>Pro-62 to Trp-75,<br>Pro-82 to Gly-113,<br>Thr-122 to Lys-135,<br>Gln-161 to Gly-169. | S0358: 4   |  |  |  |
| HWLKV34 | 957615 | 618 | 361 - 489 | 1878 |  | Thr-17 to Leu-25,<br>Asp-38 to Lys-43.  | S0358: 5   |  |  |  |
| HWLKV91 | 830214 | 619 | 242 - 430 | 1879 |  |   | S0358: 4 and<br>L0748: 1.  |  |  |  |
| HWLKW04 | 969141 | 620 | 77 - 424  | 1880 |  | Ser-17 to Leu-30,<br>Pro-72 to Lys-81,  | AR089: 52,<br>AR061: 26  |  |  |  |

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|         |        |     |           |      |  |  | Glu-86 to Ser-95,<br>His-105 to Asn-116.   | S0358: 6  |          |   |
| HWLKW09 | 951716 | 621 | 373 - 570 | 1881 |  |  | Leu-4 to Ser-11,<br>Ser-37 to Ser-42,<br>Lys-45 to Ser-51.   | S0358: 3  |          |   |
| HWLKW17 | 860227 | 622 | 76 - 186  | 1882 |  |  |  | S0358: 7  |          |   |
| HWLLB11 | 954849 | 623 | 51 - 524  | 1883 |  |  | Pro-1 to Glu-10,<br>His-60 to Arg-76,<br>Pro-79 to Arg-85,<br>Ala-95 to Ile-101,<br>Glu-124 to Glu-130,<br>Lys-151 to Arg-158. | AR061: 2, AR089:<br>2, S0358: 2,<br>L0657: 1 and<br>L0601: 1. |          |   |
| HWLLH02 | 918427 | 624 | 128 - 259 | 1884 |  |  | Gln-9 to Arg-19,<br>Cys-21 to Lys-28.  | S0358: 2  |          |   |
| HWLLH25 | 933479 | 625 | 31 - 135  | 1885 |  |  |  | S0358: 5  |          |   |
| HWLLS11 | 965899 | 626 | 106 - 318 | 1886 |  |  |  | S0358: 2, L0766:<br>1 and L0776: 1.                           |          |   |
| HWLLT02 | 918419 | 627 | 2 - 253   | 1887 |  |  | Lys-7 to Pro-12,<br>His-43 to Glu-49.  | S0358: 2  |          |   |
| HWLLV41 | 830150 | 628 | 2 - 286   | 1888 |  |  | Thr-3 to Val-11,<br>Glu-53 to Ser-67.  | S0358: 7 and<br>L0803: 1.                                     |          |   |
| HWLLX12 | 969681 | 629 | 1 - 177   | 1889 |  |  |  | S0358: 3  |          |   |
| HWLMA84 | 929421 | 630 | 3 - 137   | 1890 |  |  |  | S0376: 2  |          |   |
| HWLNX76 | 887583 | 631 | 3 - 365   | 1891 |  |  |  | S0376: 2  | 7p15-pl4 | 107776,<br>138079,<br>138079,<br>139191,<br>142959, |

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| HWLPC29 | 965058 | 632 | 6 - 329   | 1892 | Ser-17 to Asn-26,<br>Tyr-48 to Tyr-53. | S0354: 1, L0138:<br>1 and S0374: 1. |          |  |  |
| HWLPG05 | 930991 | 633 | 174 - 272 | 1893 |  | S0374: 3                            |          |  |  |
| HWLRA85 | 965400 | 634 | 442 - 591 | 1894 |  | S0360: 2                            | 5q31-q33 |  | 109690,<br>109690,<br>121050,<br>131400,<br>138040,<br>153455,<br>154500,<br>159000,<br>179095,<br>180071,<br>181460,<br>192974,<br>192974,<br>222600,<br>222600,<br>222600,<br>234000,<br>272750,<br>600807,<br>601411, |

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|         |        |     |           |      |  |  |  |  |                                      | 601596,<br>601692,<br>601692,<br>601692,<br>601692,<br>602089,<br>602121,<br>602460 |
| HWLUB86 | 966462 | 635 | 20 - 160  | 1895 |  |  |  | Tyr-9 to Ser-15.   | S0360: 1 and<br>S0328: 1.            |   |
| HWLVF04 | 926880 | 636 | 363 - 479 | 1896 |  |  |  | Thr-4 to Asp-9,<br>Cys-21 to Ile-28.   | S0360: 2                             |   |
| HWLVO06 | 933592 | 637 | 112 - 303 | 1897 |  |  |  |  | S0360: 2, L0655:<br>1 and L0666: 1.  |   |
| HWLVS52 | 925738 | 638 | 25 - 357  | 1898 |  |  |  |  | S0360: 3                             |   |
| HWLXE16 | 975258 | 639 | 108 - 344 | 1899 |  |  |  | Pro-19 to Phe-26,<br>Pro-29 to Gly-34,<br>Pro-50 to Ser-55,<br>Gly-67 to Lys-73. | S0360: 2                             |   |
| HWLXO01 | 913808 | 640 | 218 - 514 | 1900 |  |  |  | Val-20 to Pro-28,<br>Glu-45 to Gly-53.   | S0360: 2                             |   |
| HWLZB12 | 969262 | 641 | 55 - 270  | 1901 |  |  |  | Thr-1 to Phe-11,<br>Ala-28 to Pro-38.  | S0360: 2 and<br>L0774: 1.            |   |
| HWMAD05 | 931076 | 642 | 3 - 149   | 1902 |  |  |  | Lys-32 to Ala-43.  | S0354: 2                             |   |
| HWMEI07 | 830227 | 643 | 14 - 139  | 1903 |  |  |  |  | S0358: 6                             |   |
| HWMEL48 | 830256 | 644 | 264 - 157 | 1904 |  |  |  | Lys-1 to Pro-15.   | S0358: 19, S0114:<br>1 and H0436: 1. |   |
| HWMES65 | 969190 | 645 | 2 - 382   | 1905 |  |  |  | Asp-30 to Trp-35,  | AR089: 17,                           |   |



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|           |        |     |           |      |  | Ser-38 to Arg-43.  | AR061: 11,<br>S0358: 2 and<br>H0539: 1. |  |  |
| HWMEU56   | 922375 | 646 | 2 - 199   | 1906 |  | Leu-12 to His-18.  | S0358: 4                                |  |  |
| HWMF A28  | 965354 | 647 | 3 - 173   | 1907 |  | Ser-6 to Asn-16,<br>Ser-33 to Pro-45.                      | S0358: 8                                |  |  |
| HWMF G10  | 963406 | 648 | 296 - 439 | 1908 |  |  | S0358: 2                                |  |  |
| HWMF G32  | 883180 | 649 | 145 - 321 | 1909 |  |  | S0358: 4                                |  |  |
| HWMF H23  | 849129 | 650 | 169 - 2   | 1910 |  | Leu-21 to Ser-35.  | S0358: 4                                |  |  |
| HWMF Q90  | 928646 | 651 | 2 - 175   | 1911 |  | Arg-45 to Trp-53.  | S0358: 2                                |  |  |
| HWMF Y21  | 974325 | 652 | 104 - 298 | 1912 |  | Pro-9 to Cys-23,<br>Lys-31 to Ile-38.                      | S0358: 2                                |  |  |
| HWMF GL13 | 947969 | 653 | 1 - 423   | 1913 |  | Ser-4 to Thr-10,<br>Trp-26 to Gly-31,<br>Pro-63 to Gly-71. | S0358: 2                                |  |  |
| HWMF HG06 | 933534 | 654 | 253 - 399 | 1914 |  | Val-7 to Ser-13.   | S0358: 2                                |  |  |
| HWMF HG26 | 957665 | 655 | 129 - 326 | 1915 |  | Pro-9 to Pro-27,<br>Arg-39 to Glu-44,<br>Phe-61 to Leu-66. | S0358: 2 and<br>L0758: 1.               |  |  |
| HWMF HS10 | 961647 | 656 | 148 - 417 | 1916 |  | Thr-22 to Ser-27,<br>Glu-81 to Trp-87.                     | S0358: 2                                |  |  |
| HWMF HT22 | 917570 | 657 | 82 - 297  | 1917 |  |  | S0358: 2                                |  |  |
| HWMF HX12 | 914007 | 658 | 3 - 737   | 1918 |  |  | S0358: 9                                |  |  |
| HWMF HZ25 | 951699 | 659 | 110 - 355 | 1919 |  | Glu-26 to Phe-34.  | S0358: 3                                |  |  |
| HWMF ID39 | 915686 | 660 | 198 - 467 | 1920 |  | Cys-6 to Thr-11.   | S0358: 2                                |  |  |
| HWMF IR03 | 922302 | 661 | 208 - 53  | 1921 |  | Glu-3 to Pro-9,<br>Leu-28 to His-34.                       | S0358: 2                                |  |  |
| HWMF JB68 | 914031 | 662 | 157 - 336 | 1922 |  | Pro-55 to Leu-60.  | S0358: 3                                |  |  |

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| HWMIJE50 | 933501 | 663 | 32 - 76   | 1923 |  | S0358: 2  |      |   |
| HWMIKJ01 | 913841 | 664 | 2 - 226   | 1924 | Ser-46 to Pro-67.  | S0358: 2 and<br>L0744: 1.   |      |   |
| HWMIKI10 | 961616 | 665 | 1 - 354   | 1925 | Arg-19 to Gly-26.  | S0358: 3  | 4q31 | 107250,<br>181600,<br>189800,<br>266300 |
| HWMLG23  | 961110 | 666 | 2 - 247   | 1926 | Pro-3 to Val-18,<br>Val-34 to Ser-39,<br>Ala-73 to Ser-78. | S0358: 2  |      |   |
| HWMMMA12 | 969173 | 667 | 153 - 254 | 1927 | Gln-1 to Asn-12,<br>Lys-17 to Lys-30.                      | S0358: 2  |      |   |
| HWMMMG65 | 928823 | 668 | 513 - 782 | 1928 |  | S0358: 2, L0809:<br>2, L0803: 1 and<br>L0783: 1.                                  |      |   |
| HWMMMS65 | 917513 | 669 | 192 - 395 | 1929 |  | S0358: 2  |      |   |
| HWMMMY66 | 966367 | 670 | 21 - 155  | 1930 | Gly-1 to Val-18.   | S0358: 2  |      |   |
| HWMMNC07 | 951724 | 671 | 2 - 49    | 1931 | Asp-7 to Lys-16.   | S0358: 3  |      |   |
| HWNAG05  | 928811 | 672 | 452 - 724 | 1932 | Ala-1 to Asp-10,<br>Ser-19 to Ser-25,<br>Pro-45 to Asp-50. | L0005: 1, S0360:<br>1, H0036: 1, L0142:<br>1, L0143: 1, L0383:<br>1 and L0748: 1. |      |   |
| HWNB06   | 933578 | 673 | 3 - 314   | 1933 | Cys-2 to Gly-7.  | S0356: 1 and<br>S0360: 1.   |      |   |
| HWNB06   | 933587 | 674 | 186 - 374 | 1934 | Asp-1 to Lys-8,<br>Lys-44 to Thr-51.                       | S0360: 3  |      |   |
| HWNCY59  | 927487 | 675 | 237 - 73  | 1935 | Ser-1 to Lys-6.  | S0360: 2  |      |   |
| HWNEO76  | 929720 | 676 | 52 - 189  | 1936 |  | S0360: 2  |      |   |

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| HWNEX05 | 928784 | 677 | 57 - 185  | 1937 |  |  | S0360: 2   |  |  |
| HWNEY06 | 933551 | 678 | 371 - 628 | 1938 |  | His-24 to Thr-29.  | S0360: 2, H0632: 1, L0740: 1, L0777: 1 and L0759: 1. |  |  |
| HWNFZ48 | 933522 | 679 | 3 - 191   | 1939 |  | Gln-6 to Gln-11, Lys-51 to Phe-63.   | S0360: 2   |  |  |
| HWNGN09 | 961602 | 680 | 34 - 339  | 1940 |  | Arg-19 to Val-28, Ile-41 to Phe-58.  | AR089: 2, AR061: 1<br>S0360: 2                       |  |  |
| HWNHAI2 | 969205 | 681 | 625 - 422 | 1941 |  | Thr-7 to Val-12, Ser-20 to Leu-26.   | S0360: 3   |  |  |
| HXOAI14 | 974075 | 682 | 380 - 634 | 1942 |  |  | S0466: 5 and S0464: 1.                               |  |  |
| HXOAA67 | 974326 | 683 | 32 - 232  | 1943 |  | Asn-22 to Pro-35.  | S0466: 1   |  |  |
| HWNHN10 | 961609 | 684 | 3 - 659   | 1944 |  | Thr-4 to Ser-10, Glu-12 to Asn-18, Pro-31 to Pro-43, Glu-79 to Glu-97, Gln-107 to Leu-112, Ser-136 to Trp-143, Pro-150 to Trp-172, Pro-183 to Cys-195, Thr-204 to Lys-212. | L0779: 2 and S0360: 1.                               |  |  |
| HWNDU11 | 965382 | 685 | 40 - 303  | 1945 |  | Gly-1 to Val-8, Pro-17 to Cys-23, Cys-38 to Thr-44, Arg-76 to Asn-85.  | S0360: 1 and L0777: 1.                               |  |  |
| HWNCN05 | 928791 | 686 | 113 - 811 | 1946 |  | Gly-28 to Gly-34, Pro-39 to Phe-46,  | L0750: 2, S0360: 1 and L0759: 1.                     |  |  |

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| HWNBX05 | 928800 | 687 | 298 - 414 | 1947 | Pro-75 to Asp-90.<br>Cys-22 to Ala-31.  | S0360: 1 and<br>L0439: 1.   |         |                   |
| HWNBL12 | 969222 | 688 | 3 - 86    | 1948 |   | S0360: 1, L0717:<br>1, L0777: 1 and<br>L0755: 1.                                  |         |                   |
| HWNAL06 | 933591 | 689 | 294 - 425 | 1949 | Thr-12 to Gln-22,<br>Thr-33 to Ser-41.  | S0360: 1 and<br>L0759: 1.   |         |                   |
| HWNAE01 | 914082 | 690 | 492 - 782 | 1950 | Glu-1 to Leu-12,<br>Arg-83 to Gln-97.   | L0748: 3, L0743:<br>2, L0749: 2 and<br>S0360: 1.                                  |         |                   |
| HWMGO10 | 961716 | 691 | 23 - 169  | 1951 |   | S0358: 1, L0717:<br>1, L0770: 1, L0518:<br>1, L0666: 1, L0747:<br>1 and L0752: 1. | 21q22.2 | 176261,<br>601399 |
| HWMBY62 | 937234 | 692 | 135 - 479 | 1952 |   | S0376: 1 and<br>L0749: 1.   | 18      |                   |
| HWMBM89 | 968984 | 693 | 161 - 54  | 1953 |   | L0747: 2, L0755:<br>2, S0376: 1, L0369:<br>1, L0775: 1, L0777:<br>1 and L0759: 1. |         |                   |
| HWMAE12 | 969692 | 694 | 3 - 515   | 1954 | Gln-6 to His-16,<br>Ser-39 to Met-45,<br>Asn-57 to Arg-71,<br>Glu-78 to Gln-83,<br>Val-110 to Thr-117,<br>Ser-130 to Val-147. | S0354: 1, L0529:<br>1 and L0741: 1.   |         |                   |
| HWLXJ10 | 963328 | 695 | 44 - 283  | 1955 | Arg-15 to Ser-26.   | S0360: 1 and<br>L0803: 1.   |         |                   |

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| HWLVU33 | 972979 | 696 | 2 - 340   | 1956 | Ser-50 to Pro-56,<br>Pro-68 to Val-77. | S0360: 1 and<br>L0758: 1.   |  |  |
| HWLVK02 | 922696 | 697 | 412 - 212 | 1957 | Ser-29 to Pro-34,<br>Arg-47 to Thr-62. | L0755: 3, L0776:<br>2, S0360: 1, L0763:<br>1 and L0756: 1.              |  |  |
| HWLUY15 | 874966 | 698 | 156 - 308 | 1958 |  | S0360: 1, L0776:<br>1 and L0758: 1.                                     |  |  |
| HWLQS70 | 933799 | 699 | 379 - 528 | 1959 | Ala-5 to Met-10,<br>Ser-44 to Arg-50.  | L0766: 4, S0360:<br>1, L0771: 1 and<br>L0731: 1.                        |  |  |
| HWLQA64 | 918932 | 700 | 96 - 164  | 1960 |  | S0360: 1 and<br>L0439: 1.   |  |  |
| HWLPN12 | 969572 | 701 | 170 - 337 | 1961 | Thr-25 to Thr-39.                      | L0766: 2, S0374:<br>1, L0759: 1 and<br>L0485: 1.                        |  |  |
| HWLOL02 | 918320 | 702 | 191 - 301 | 1962 |  | S0376: 1, L0521:<br>1, L0750: 1 and<br>L0779: 1.                        |  |  |
| HWLOB68 | 908500 | 703 | 6 - 401   | 1963 |  | AR061: 1, AR089:<br>1<br>S0376: 1 and<br>L0740: 1.                      |  |  |
| HWLNC88 | 875790 | 704 | 387 - 572 | 1964 | Thr-12 to Phe-19,<br>Lys-57 to Lys-62. | L0803: 2, S0376:<br>1, L0763: 1 and<br>L0759: 1.                        |  |  |
| HWLNA36 | 974863 | 705 | 607 - 317 | 1965 |  | L0794: 3, L0803:<br>2, S0376: 1, L0774:<br>1, L0665: 1 and<br>L0731: 1. |  |  |

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| HWLMP16 | 918726 | 706 | 236 - 400 | 1966 |                                     |  | S0376: 1 and L0759: 1.                |    |  |
| HWLLZ91 | 887157 | 707 | 2 - 463   | 1967 | Ser-35 to Ser-47.                   |  | AR051: 1, AR050: 1, AR054: 0 S0358: 1 |    |  |
| HWLLD02 | 930932 | 708 | 432 - 265 | 1968 |                                     |  | S0358: 1 and L0662: 1.                | 10 |  |
| HWLKT19 | 974292 | 709 | 1 - 261   | 1969 |                                     |  | S0358: 1                              |    |  |
| HWLKQ11 | 965390 | 710 | 3 - 122   | 1970 |                                     |  | S0358: 1                              |    |  |
| HWLKJ18 | 930414 | 711 | 207 - 473 | 1971 |                                     |  | S0358: 1                              |    |  |
| HWLKJ03 | 922371 | 712 | 253 - 468 | 1972 |                                     |  | S0358: 1 and L0776: 1.                |    |  |
| HWLJW12 | 969556 | 713 | 50 - 241  | 1973 | Ser-32 to Trp-37, His-48 to Tyr-55. |  | S0358: 1 and L0764: 1.                |    |  |
| HWLJW11 | 924518 | 714 | 260 - 451 | 1974 | Pro-23 to Ser-29.                   |  | S0358: 1 and L0747: 1.                |    |  |
| HWLJU91 | 789882 | 715 | 45 - 254  | 1975 | Ser-24 to His-40.                   |  | S0358: 1, L0748: 1 and L0596: 1.      |    |  |
| HWLJP28 | 925655 | 716 | 22 - 204  | 1976 |                                     |  | S0358: 1, L0766: 1 and L0750: 1.      |    |  |
| HWLJM40 | 710519 | 717 | 204 - 416 | 1977 | Pro-33 to Lys-38, Lys-49 to Asn-57. |  | S0358: 1 and L0747: 1.                |    |  |
| HWLJK01 | 914089 | 718 | 334 - 504 | 1978 | His-7 to Leu-12.                    |  | S0358: 1 and L0774: 1.                |    |  |
| HWLIS95 | 795416 | 719 | 109 - 231 | 1979 |                                     |  | S0358: 1 and L0744: 1.                |    |  |
| HWLIG05 | 928226 | 720 | 101 - 217 | 1980 |                                     |  | S0358: 1 and L0747: 1.                |    |  |

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| HWLID27 | 682563 | 721 | 275 - 427 | 1981 |   |  | S0358: 1 and L0754: 1.                     |  |  |
| HWLHW01 | 915161 | 722 | 193 - 351 | 1982 |   |  | S0354: 1, L0775: 1 and L0758: 1.           |  |  |
| HWLHU03 | 922931 | 723 | 218 - 406 | 1983 |   |  | L0539: 1 and S0354: 1.                     |  |  |
| HWLHK09 | 949288 | 724 | 276 - 707 | 1984 | Ser-1 to Arg-12, Glu-19 to Arg-24, Gly-36 to Ser-41, Arg-73 to Pro-79.  |  | S0354: 1 and L0775: 1.                     |  |  |
| HWLHH62 | 876225 | 725 | 20 - 277  | 1985 | Met-1 to Trp-10.  |  | L0754: 2 and S0354: 1.                     |  |  |
| HWLHD19 | 887203 | 726 | 3 - 632   | 1986 |   |  | AR051: 11, AR050: 9, AR054: 8 S0354: 1     |  |  |
| HWLGV14 | 967914 | 727 | 46 - 444  | 1987 |   |  | AR061: 42, AR089: 3 S0354: 1 and L0748: 1. |  |  |
| HWLGA04 | 925682 | 728 | 174 - 344 | 1988 |   |  | L0766: 3, S0354: 1 and L0751: 1.           |  |  |
| HWLFY91 | 789569 | 729 | 405 - 572 | 1989 | His-8 to Met-14, Gly-16 to Lys-31.                                      |  | S0354: 1 and L0605: 1.                     |  |  |
| HWLFY06 | 934635 | 730 | 15 - 296  | 1990 | Pro-12 to Gln-22, Thr-34 to Phe-42, Leu-53 to Thr-65, Leu-73 to Gly-80. |  | L0749: 3, S0354: 1, L0769: 1 and L0806: 1. |  |  |
| HWLFV52 | 950978 | 731 | 70 - 357  | 1991 | Pro-27 to Gly-34.   |  | S0354: 1 and                               |  |  |

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| HWLFAQ39 | 705200 | 732  | 3 - 236   | 1992 |  |   | L0759: 1.<br>L0438: 7, L0439:<br>5, L0805: 2, L0415:<br>1, S0354: 1, L0787:<br>1 and L0741: 1. |  |  |
| HWLFM69  | 754644 | 733  | 2 - 559   | 1993 |  |   | L0777: 2 and<br>S0354: 1.  |  |  |
| HWLFH36  | 708387 | 734  | 2 - 142   | 1994 |  | Arg-10 to Asp-15.   | S0354: 1 and<br>L0754: 1.  |  |  |
| HWLFB71  | 759915 | 735  | 279 - 596 | 1995 |  | Gln-11 to Glu-18,<br>Asn-57 to Glu-64.                      | S0354: 1 and<br>L0748: 1.  |  |  |
| HWLEZ11  | 966228 | 736  | 372 - 539 | 1996 |  | Lys-24 to Gly-46.   | S0354: 1 and<br>L0605: 1.  |  |  |
| HWLEQ61  | 741224 | 737  | 59 - 205  | 1997 |  | Ser-18 to Trp-32.   | L0439: 2 and<br>S0354: 1.  |  |  |
| HWLEM80  | 886651 | 738  | 27 - 671  | 1998 |  | Arg-11 to Val-19,<br>Tyr-23 to Asp-48,<br>Ser-61 to Gly-96. | AR051: 18,<br>AR050: 1<br>S0354: 1   |  |  |
| HWLEM01  | 915547 | 739  | 144 - 314 | 1999 |  |   | S0354: 1 and<br>L0526: 1.  |  |  |
| HWLEL08  | 860161 | 740  | 328 - 576 | 2000 |  | Gly-17 to Arg-23,<br>Arg-55 to His-60.                      | AR050: 97,<br>AR054: 84,<br>AR051: 70<br>S0354: 1  |  |  |
|          | 908147 | 1263 | 334 - 582 | 2523 |  | Gly-17 to Arg-23,<br>Arg-55 to His-60.                      |  |  |  |
| HWLEK75  | 766928 | 741  | 463 - 567 | 2001 |  |   | S0354: 1, L0742:<br>1, L0748: 1 and  |  |  |



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| HWLEI57 | 734267 | 742 | 389 - 195 | 2002 | Thr-35 to Ala-43.   | L0592: 1.<br>AR050: 109,<br>AR051: 105,<br>AR054: 100<br>S0354: 1           |  |  |  |
| HWLEH70 | 874721 | 743 | 2 - 454   | 2003 | Gly-11 to Ser-23,<br>Lys-41 to Gln-48,<br>Lys-70 to Asp-77.                     | S0354: 1 and<br>L0749: 1.   |  |  |  |
| HWLEF27 | 682572 | 744 | 2 - 268   | 2004 | Gln-6 to Pro-26,<br>Pro-28 to Phe-44,<br>Arg-54 to Ile-67,<br>Leu-80 to Gly-89. | S0354: 1 and<br>L0439: 1.   |  |  |  |
| HWLEA48 | 927676 | 745 | 100 - 408 | 2005 | Pro-1 to Thr-8.   | AR089: 1, AR061:<br>0<br>S0354: 1 and<br>L0596: 1.                          |  |  |  |
| HWLDX03 | 922806 | 746 | 2 - 187   | 2006 | Gly-13 to Trp-21.   | L0763: 1, S0374:<br>1 and L0747: 1.   |  |  |  |
| HWLDB04 | 887051 | 747 | 1 - 297   | 2007 | Pro-6 to Ser-11.  | AR051: 25,<br>AR054: 20,<br>AR050: 20,<br>AR089: 1, AR061:<br>0<br>S0374: 1 |  |  |  |
| HWLCM06 | 934117 | 748 | 170 - 406 | 2008 |   | L0533: 1 and<br>S0374: 1.   |  |  |  |
| HWLCG42 | 975246 | 749 | 321 - 503 | 2009 | Lys-11 to His-16,<br>Ser-28 to Thr-36,<br>Ala-46 to Gln-55.                     | L0641: 1 and<br>S0374: 1.   |  |  |  |

|          |        |     |           |      |   |  |      |  |  |
|----------|--------|-----|-----------|------|---|--|------|--|--|
| HWLCD10  | 974071 | 750 | 485 - 102 | 2010 |   | S0374: 1                                   |      |  |  |
| HWLBO06  | 934630 | 751 | 22 - 243  | 2011 | Pro-32 to Asp-61.                                     | L0021: 1, L0803: 1, S0374: 1 and L0752: 1. |      |  |  |
| HWLBN90  | 787355 | 752 | 392 - 610 | 2012 | Gly-34 to Glu-41, Glu-46 to Arg-53, Thr-62 to Val-68. | S0374: 1 and L0777: 1.                     |      |  |  |
| HWLBLE75 | 766877 | 753 | 305 - 601 | 2013 | Asn-28 to Thr-34.                                     | S0374: 1 and L0731: 1.                     |      |  |  |
| HWLBI01  | 919168 | 754 | 56 - 274  | 2014 |   | S0374: 1 and L0748: 1.                     | 7q22 | 126650, 126650, 154276, 173360, 173360, 602136, 602136, 602136, 602447 |  |
| HWLAU04  | 953433 | 755 | 3 - 290   | 2015 | Thr-12 to Thr-24.                                     | L0763: 1 and S0374: 1.                     | 5p15 | 123000, 600857   |  |
| HWLAQ11  | 966207 | 756 | 77 - 214  | 2016 |   | L0805: 3, L0738: 1 and S0374: 1.           |      |  |  |
| HWLAL10  | 971666 | 757 | 2 - 184   | 2017 | Asp-4 to Pro-9.                                       | L0662: 1 and S0374: 1.                     |      |  |  |
| HWLAC70  | 775771 | 758 | 76 - 237  | 2018 |   | S0374: 1 and L0744: 1.                     |      |  |  |
| HWLAC29  | 690263 | 759 | 3 - 155   | 2019 |   | L0748: 3 and S0374: 1.                     |      |  |  |
| HWLAB74  | 765196 | 760 | 322 - 468 | 2020 | Tyr-17 to Cys-22.                                     | L0439: 5 and                               |      |  |  |

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| HWGQA42 | 713348 | 761 | 103 - 297 | 2021 |   |  | S0374: 1.<br>S0382: 1 and<br>L0744: 1.                                  |  |  |  |
| HWCAG11 | 966623 | 762 | 1 - 246   | 2022 | Thr-30 to Glu-35.   |  | S0294: 1, L0766:<br>1 and L0777: 1.                                     |  |  |  |
| HWCAD06 | 886808 | 763 | 2 - 571   | 2023 | Pro-19 to Gln-38,<br>Ser-45 to Arg-50,<br>Gly-135 to Lys-143,<br>Arg-148 to Ser-156,<br>Val-174 to Tyr-179. |  | AR051: 11,<br>AR054: 2, AR050:<br>1<br>S0294: 1                         |  |  |  |
| HVATY05 | 928713 | 764 | 486 - 683 | 2024 | Asn-37 to Gln-45,<br>Leu-56 to Lys-66.  |  | L0598: 2, L0752:<br>2, L0753: 2, L0364:<br>1, L0776: 1 and<br>S0380: 1. |  |  |  |
| HVASI79 | 951617 | 765 | 3 - 638   | 2025 |   |  | L0764: 1, S0380:<br>1 and L0749: 1.                                     |  |  |  |
| HVAPI01 | 913930 | 766 | 323 - 490 | 2026 | Met-4 to Trp-9,<br>Phe-37 to Ser-43.  |  | L0775: 1 and<br>S0380: 1.   |  |  |  |
| HVAET01 | 913958 | 767 | 32 - 145  | 2027 |   |  | L0776: 1 and<br>S0378: 1.   |  |  |  |
| HVAEP04 | 925914 | 768 | 2 - 172   | 2028 |   |  | L0663: 1 and<br>S0378: 1.   |  |  |  |
| HVACY04 | 926473 | 769 | 63 - 281  | 2029 |   |  | L0809: 1, S0378:<br>1, L0439: 1 and<br>L0599: 1.                        |  |  |  |
| HUTSF11 | 966029 | 770 | 3 - 302   | 2030 | Glu-1 to Glu-6,<br>Asn-16 to Arg-22.  |  | AR089: 0, AR061:<br>0<br>S0464: 1 and<br>L0356: 1.                      |  |  |  |

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| HUTAF08 | 958353 | 771 | 197 - 391 | 2031 | Thr-20 to Ala-28.  | S0440: 1, L0779: 1 and L0758: 1. |         |  |
| HUFGC48 | 950707 | 772 | 3 - 443   | 2032 | Lys-32 to Trp-37, Asp-81 to Asn-88, His-93 to Leu-98.                  | L0589: 1 and H0506: 1.           |         |  |
| HUFFW06 | 934895 | 773 | 1 - 330   | 2033 |  | L0747: 1 and H0506: 1.           |         |  |
| HUFFC02 | 969054 | 774 | 2 - 238   | 2034 | Ala-37 to Arg-52.  | L0590: 1 and H0506: 1.           |         |  |
| HUFDO11 | 966407 | 775 | 100 - 309 | 2035 |  | H0506: 1.                        |         |  |
| HUFDN22 | 783765 | 776 | 143 - 436 | 2036 | Val-9 to Asp-17, Ile-55 to Tyr-60, Pro-69 to Asp-82, Asp-89 to Tyr-94. | L0777: 1 and H0506: 1.           | 15q13   | 103581, 146150, 218000, 227220, 601623, 601800, 601889, 602117 |
| HUFDH29 | 689979 | 777 | 287 - 493 | 2037 | Arg-57 to His-69.  | L0439: 4, L0581: 1 and H0506: 1. |         |  |
| HUFDB03 | 923561 | 778 | 144 - 473 | 2038 |  | L0740: 2 and H0506: 1.           |         |  |
| HUFCO89 | 786817 | 779 | 141 - 257 | 2039 |  | H0506: 1                         |         |  |
| HUFCO04 | 731462 | 780 | 1 - 171   | 2040 |  | H0506: 1                         |         |  |
| HUFCI80 | 773161 | 781 | 468 - 821 | 2041 | Glu-45 to Val-57.  | L0362: 1 and H0506: 1.           |         |  |
| HUFBP22 | 582067 | 782 | 36 - 509  | 2042 | Asp-66 to Ser-80, Thr-109 to Tyr-114,                                  | AR050: 130, AR051: 121,          | 14q11.2 | 182600, 186880,  |

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|         |        |     |           |      | Pro-145 to Asp-152.   | AR054: 109<br>H0506: 1  |  | 190195,<br>190195,<br>222700,<br>600243,<br>602279,<br>602279 |
| HUFBD16 | 661856 | 783 | 222 - 359 | 2043 |   | L0748: 2 and<br>H0506: 1.                                     |  |   |
| HUFAU90 | 787302 | 784 | 323 - 490 | 2044 |   | L0756: 1 and<br>H0506: 1.                                     |  |   |
| HUFAO77 | 772133 | 785 | 2 - 97    | 2045 |   | L0439: 1 and<br>H0506: 1.                                     |  |   |
| HUFAO24 | 467860 | 786 | 34 - 327  | 2046 | Thr-11 to Cys-21,<br>Ala-27 to Leu-32,<br>Pro-56 to Gln-72. | L0757: 1 and<br>H0506: 1.                                     |  |   |
| HUFAJ16 | 621443 | 787 | 757 - 467 | 2047 |   | L0665: 1, L0745:<br>1 and H0506: 1.                           |  |   |
| HUFAG52 | 727087 | 788 | 64 - 222  | 2048 |   | UNKWN: 1,<br>L0598: 1, L0766: 1,<br>L0439: 1 and<br>H0506: 1. |  |   |
| HUFAB12 | 970725 | 789 | 3 - 281   | 2049 | Thr-50 to Thr-93.   | L0777: 2, L0769:<br>1, L0800: 1, L0740:<br>1 and H0506: 1.    |  |   |
| HTPHG02 | 918237 | 790 | 1 - 273   | 2050 |   | H0622: 1, L0748:<br>1 and L0749: 1.                           |  |   |
| HTPFS02 | 918251 | 791 | 2 - 271   | 2051 | Gln-34 to Pro-41.   | H0622: 1 and<br>L0581: 1.                                     |  |   |
| HTPFF82 | 869864 | 792 | 135 - 440 | 2052 | Pro-83 to Asn-88.   | H0622: 1  |  |   |

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| HTPFF81 | 869862 | 793  | 193 - 381      | 2053 | Ser-2 to Phe-8.   | H0622: 1   |  |  |
| HTPEI73 | 465462 | 794  | 3 - 269        | 2054 | His-1 to Gln-9,<br>Glu-11 to Ser-20,<br>Ser-23 to Pro-49.   | H0039: 1   |  |  |
| HTPDZ79 | 968067 | 795  | 3 - 611        | 2055 | His-1 to Thr-7,<br>Ile-45 to Ser-50,<br>Ser-58 to Asp-63,<br>Gly-66 to Gln-89,<br>Leu-97 to Pro-114,<br>Ser-126 to Phe-132,<br>Lys-140 to Lys-145,<br>Ser-156 to Glu-166. | L0439: 3, L0438:<br>2, H0039: 1 and<br>L0748: 1.           |  |  |
| HTPDV49 | 931787 | 796  | 1501 -<br>1214 | 2056 | Leu-18 to Asn-25.   | H0039: 1   |  |  |
|         | 956048 | 1264 | 1108 -<br>1395 | 2524 | Leu-18 to Asn-25,<br>Leu-70 to Cys-76.  |  |  |  |
| HTPDA96 | 796101 | 797  | 99 - 302       | 2057 | Glu-26 to Leu-33,<br>Asn-51 to Arg-58,<br>Val-61 to Cys-68.   | H0039: 1 and<br>L0756: 1.                                  |  |  |
| HTPCZ41 | 576943 | 798  | 3 - 431        | 2058 |   | L0596: 4, H0039:<br>1, L0761: 1, L0659:<br>1 and L0809: 1. |  |  |
| HTPCV43 | 459467 | 799  | 176 - 460      | 2059 |   | H0039: 1, L0744:<br>1 and L0755: 1.                        |  |  |
| HTPCS79 | 835550 | 800  | 1 - 390        | 2060 |   | L0741: 3 and<br>H0039: 1.                                  |  |  |
| HTPCR30 | 574757 | 801  | 26 - 241       | 2061 |   | H0039: 1 and<br>L0748: 1.                                  |  |  |
| HTPCE41 | 712642 | 802  | 1 - 420        | 2062 |   | H0039: 1 and   |  |  |

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| HTPBX04 | 927828 | 803 | 125 - 265 | 2063 |   | L0766: 1.<br>H0039: 1, L0438:<br>1 and L0439: 1.                        |  |  |
| HTPBU39 | 530441 | 804 | 2 - 172   | 2064 |   | H0039: 1  |  |  |
| HTPBU35 | 530440 | 805 | 1 - 366   | 2065 | Ser-16 to Phe-24.   | L0766: 5, H0039:<br>1, L0769: 1, L0774:<br>1, L0806: 1 and<br>L0779: 1. |  |  |
| HTPBD55 | 754147 | 806 | 169 - 2   | 2066 | Lys-1 to Pro-7,<br>Gln-46 to Lys-56.                        | H0039: 1, L0748:<br>1, L0749: 1 and<br>L0596: 1.                        |  |  |
| HTPAT20 | 668771 | 807 | 235 - 375 | 2067 |   | H0039: 1 and<br>L0603: 1.   |  |  |
| HTPAP93 | 791415 | 808 | 78 - 218  | 2068 | Cys-32 to Gln-38.   | H0039: 1 and<br>L0581: 1.   |  |  |
| HTPAO01 | 961062 | 809 | 2 - 280   | 2069 | Ile-13 to Thr-19.   | L0758: 6, L0777:<br>2, H0039: 1,<br>UNKWN: 1 and<br>L0598: 1.           |  |  |
| HTPAI20 | 937644 | 810 | 2 - 418   | 2070 | Thr-17 to Lys-32,<br>Lys-45 to Gly-64,<br>Glu-78 to Arg-91. | H0039: 1 and<br>L0761: 1.   |  |  |
| HTPAG06 | 960784 | 811 | 3 - 230   | 2071 | Leu-13 to Lys-30,<br>Leu-36 to Ser-45,<br>Gln-48 to Glu-69. | H0039: 1 and<br>L0589: 1.   |  |  |
| HTPAE77 | 772737 | 812 | 286 - 534 | 2072 | Val-7 to Leu-13.  | H0039: 1 and<br>L0362: 1.   |  |  |
| HTNTA60 | 840258 | 813 | 79 - 213  | 2073 |   | L0601: 2 and  |  |  |

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| HTNGF71 | 870037 | 814 | 195 - 368 | 2074 | His-1 to Cys-7.   | S0446: 1.<br>L0592: 1 and<br>S0456: 1.                             |  |  |  |
| HSPMF55 | 871310 | 815 | 161 - 271 | 2075 |   | H0479: 1 and<br>L0756: 1.  |  |  |  |
| HSPMF20 | 575826 | 816 | 1 - 87    | 2076 |   | H0479: 1   |  |  |  |
| HSPBD58 | 735472 | 817 | 296 - 457 | 2077 | Ala-1 to Gly-6,<br>Pro-19 to Asp-28,<br>Lys-38 to Glu-54.   | H0478: 1 and<br>L0600: 1.  |  |  |  |
| HSPBC71 | 759886 | 818 | 658 - 903 | 2078 |   | L0598: 4,<br>UNKWN: 2,<br>H0478: 1, L0748: 1<br>and L0754: 1.      |  |  |  |
| HSPAY58 | 964178 | 819 | 214 - 534 | 2079 | Ser-29 to Leu-34,<br>Leu-53 to Gly-62,<br>Lys-80 to Asn-86,<br>Ser-94 to Asp-99,<br>Ile-102 to Lys-107. | AR054: 31,<br>AR050: 25,<br>AR051: 18<br>L0748: 2 and<br>H0478: 1. |  |  |  |
| HSPAI56 | 582583 | 820 | 1 - 261   | 2080 | Ala-12 to Ala-37,<br>Ser-47 to Glu-52,<br>Ser-77 to Ser-87.   | H0478: 1 and<br>L0439: 1.  |  |  |  |
| HSPAI52 | 727212 | 821 | 99 - 395  | 2081 | Phe-23 to Lys-29.   | H0478: 1 and<br>L0439: 1.  |  |  |  |
| HSPAB58 | 736098 | 822 | 3 - 116   | 2082 | Ser-20 to Tyr-25.   | AR089: 1, AR061:<br>0<br>H0478: 1, L0748:<br>1 and L0749: 1.       |  |  |  |
| HSODZ52 | 825096 | 823 | 89 - 298  | 2083 |   | L0748: 1 and<br>H0595: 1.  |  |  |  |



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| HSODZ07 | 955932 | 824 | 245 - 505 | 2084 | Thr-11 to Lys-23,<br>Lys-45 to Gly-63.                      | AR061: 10,<br>AR089: 5<br>H0595: 1                         |  |  |
| HSODV84 | 782529 | 825 | 454 - 612 | 2085 |   | L0745: 3 and<br>H0595: 1.                                  |  |  |
| HSODU86 | 784754 | 826 | 3 - 149   | 2086 |   | L0740: 2 and<br>H0595: 1.                                  |  |  |
| HSODS38 | 709399 | 827 | 219 - 362 | 2087 |   | L0748: 1 and<br>H0595: 1.                                  |  |  |
| HSODR06 | 934645 | 828 | 1 - 234   | 2088 |   | L0589: 2 and<br>H0595: 1.                                  |  |  |
| HSODK89 | 786581 | 829 | 111 - 269 | 2089 |   | L0754: 1 and<br>H0595: 1.                                  |  |  |
| HSODH33 | 701833 | 830 | 76 - 267  | 2090 | Ser-43 to Phe-57.   | L0794: 1, L0756:<br>1 and H0595: 1.                        |  |  |
| HSODE10 | 963727 | 831 | 166 - 327 | 2091 | Arg-6 to Ile-11.  | L0783: 1, L0747:<br>1, L0777: 1, L0759:<br>1 and H0595: 1. |  |  |
| HSODD28 | 685884 | 832 | 67 - 222  | 2092 | Phe-18 to Tyr-23,<br>Tyr-35 to Asn-40,<br>Arg-42 to Lys-52. | L0763: 1, L0754:<br>1 and H0595: 1.                        |  |  |
| HSOBR45 | 717282 | 833 | 141 - 296 | 2093 | Lys-1 to Asp-10.  | L0749: 1 and<br>H0595: 1.                                  |  |  |
| HSOBP04 | 871340 | 834 | 270 - 434 | 2094 |   | L0766: 1 and<br>H0595: 1.                                  |  |  |
| HSOBO01 | 882825 | 835 | 73 - 273  | 2095 |   | L0748: 1 and<br>H0595: 1.                                  |  |  |
| HSOBN03 | 923315 | 836 | 1 - 183   | 2096 | Lys-5 to Pro-11.  | L0777: 1, L0759:   |  |  |

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| HSOBM53 | 727811 | 837 | 227 - 400 | 2097 | Asn-23 to Leu-33. | 1 and H0595: 1.<br>L0749: 1 and<br>H0595: 1.   |  |  |  |
| HSOBK75 | 766940 | 838 | 86 - 280  | 2098 |                   | L0756: 1 and<br>H0595: 1.  |  |  |  |
| HSOBI75 | 766949 | 839 | 252 - 434 | 2099 | Leu-10 to Asn-18. | L0754: 1 and<br>H0595: 1.  |  |  |  |
| HSOBH84 | 782118 | 840 | 20 - 133  | 2100 | Ser-11 to Ser-16. | L0746: 1 and<br>H0595: 1.  |  |  |  |
| HSOBF30 | 691440 | 841 | 331 - 534 | 2101 | Arg-7 to Thr-13.  | L0757: 2, L0717:<br>1, L0803: 1, L0805:<br>1, L0658: 1, L0809:<br>1, L0665: 1, L0740:<br>1, L0750: 1, L0779:<br>1, L0731: 1, L0758:<br>1 and H0595: 1. |  |  |  |
| HSOBE61 | 908598 | 842 | 223 - 393 | 2102 | Asn-42 to Asn-48. | AR089: 6, AR061:<br>2<br>L0766: 2, L0755:<br>1 and H0595: 1.   |  |  |  |
| HSOBE03 | 923322 | 843 | 261 - 362 | 2103 |                   | L0529: 2, L0543:<br>1, L0751: 1 and<br>H0595: 1.   |  |  |  |
| HSOBC07 | 952409 | 844 | 217 - 417 | 2104 |                   | L0749: 1 and<br>H0595: 1.  |  |  |  |
| HSOBB11 | 966281 | 845 | 2 - 97    | 2105 |                   | L0770: 1, L0748:<br>1 and H0595: 1.  |  |  |  |
| HSOAV63 | 745328 | 846 | 75 - 302  | 2106 | Glu-2 to Trp-11.  | L0748: 2 and<br>H0343: 1.  |  |  |  |

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| HSOAV11 | 967590 | 847 | 321 - 515 | 2107 |  | L0805: 1 and<br>H0343: 1.           |        |  |
| HSOAO64 | 746993 | 848 | 42 - 185  | 2108 |  | L0754: 1 and<br>H0343: 1.           |        |  |
| HSOAM10 | 968316 | 849 | 50 - 187  | 2109 |  | H0343: 1 and<br>L0591: 1.           |        |  |
| HSOAM07 | 953954 | 850 | 11 - 337  | 2110 | Asn-7 to Arg-14,<br>Arg-20 to Ser-26,<br>Ser-60 to Glu-67,<br>Thr-77 to Thr-84,<br>Ser-91 to Glu-97. | L0758: 1 and<br>H0343: 1.           |        |  |
| HSOAI35 | 537540 | 851 | 85 - 306  | 2111 | Pro-29 to Ser-35,<br>Pro-41 to Ser-49,<br>Ser-62 to Arg-67.  | L0439: 2, L0363:<br>1 and H0343: 1. |        |  |
| HSOAG31 | 698357 | 852 | 160 - 306 | 2112 |  | L0756: 1 and<br>H0343: 1.           |        |  |
| HSOAF76 | 877300 | 853 | 2 - 217   | 2113 | Gln-13 to Lys-20,<br>Ala-24 to Cys-31.   | L0749: 1 and<br>H0343: 1.           |        |  |
| HSIGL32 | 698756 | 854 | 15 - 158  | 2114 | Lys-1 to Tyr-16,<br>Glu-41 to Gly-48.  | H0590: 1 and<br>L0439: 1.           |        |  |
| HSIGK77 | 771815 | 855 | 1 - 159   | 2115 |  | H0590: 1 and<br>L0581: 1.           | 9q34.1 | 103000,<br>114350,<br>120900,<br>131195,<br>185000,<br>189980,<br>600184,<br>602575,<br>602575 |

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| HSIGK64 | 746241 | 856 | 261 - 422 | 2116 | Ser-11 to Glu-16.                      | L0439: 2 and<br>H0590: 1.   |  |  |
| HSIGJ94 | 793624 | 857 | 117 - 284 | 2117 |  | AR061: 8, AR089:<br>7<br>H0590: 1, L0766:<br>1, L0659: 1, L0608:<br>1 and L0362: 1. |  |  |
| HSIGG54 | 887545 | 858 | 3 - 461   | 2118 | Ser-17 to Leu-25.                      | AR051: 4, AR050:<br>3, AR054: 1<br>H0590: 1   |  |  |
| HSIGG42 | 713339 | 859 | 151 - 363 | 2119 | Arg-25 to Ser-31,<br>Ala-54 to Pro-60. | H0590: 1 and<br>L0746: 1.   |  |  |
| HSIGF42 | 866561 | 860 | 193 - 441 | 2120 | Ala-13 to Ser-23.                      | H0590: 1 and<br>L0438: 1.   |  |  |
| HSIGD15 | 659718 | 861 | 268 - 414 | 2121 |  | L0748: 2, H0590:<br>1 and L0749: 1.   |  |  |
| HSIGA25 | 677668 | 862 | 347 - 487 | 2122 |  | H0590: 1, L0774:<br>1 and L0751: 1.   |  |  |
| HSIFZ27 | 682580 | 863 | 35 - 265  | 2123 | Gln-1 to Pro-16,<br>Pro-61 to Asn-68.  | H0590: 1 and<br>L0748: 1.   |  |  |
| HSIFY57 | 734373 | 864 | 703 - 942 | 2124 |  | H0590: 1, L0439:<br>1 and L0754: 1.   |  |  |
| HSIFV93 | 792005 | 865 | 210 - 383 | 2125 |  | H0590: 1 and<br>L0756: 1.   |  |  |
| HSIFV59 | 786436 | 866 | 105 - 488 | 2126 | Gln-57 to Pro-63.                      | H0590: 1 and<br>L0605: 1.   |  |  |
| HSIFR52 | 726370 | 867 | 3 - 305   | 2127 | Lys-1 to Trp-10,<br>Arg-57 to Val-62.  | H0590: 1 and<br>L0756: 1.   |  |  |

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| HSIFL30 | 691630 | 868 | 3 - 113   | 2128 |  |  | H0590: 1 and L0748: 1.   |  |  |
| HSIFK84 | 782810 | 869 | 2 - 493   | 2129 | Pro-8 to Arg-15,<br>Arg-20 to Gly-36,<br>Asp-47 to Lys-54.   |  | H0590: 1, L0745: 1 and L0750: 1.   |  |  |
| HSIFH19 | 668188 | 870 | 100 - 360 | 2130 |  |  | H0590: 1 and L0748: 1.   |  |  |
| HSIFD30 | 691636 | 871 | 81 - 272  | 2131 |  |  | L0777: 3, H0590: 1, L0766: 1, L0774: 1, L0789: 1, L0740: 1 and L0731: 1. |  |  |
| HSIED64 | 747012 | 872 | 129 - 383 | 2132 | Gly-1 to Ser-15.   |  | H0036: 1 and L0747: 1.   |  |  |
| HSIED52 | 726017 | 873 | 16 - 252  | 2133 | Asn-21 to Trp-28,<br>Gln-68 to Ser-73.   |  | L0747: 3 and H0036: 1.   |  |  |
| HSIEA68 | 753612 | 874 | 2 - 319   | 2134 |  |  | H0036: 1, L0748: 1 and L0749: 1.   |  |  |
| HSIDZ18 | 666892 | 875 | 36 - 296  | 2135 | Glu-1 to Ser-7.  |  | H0036: 1 and L0608: 1.   |  |  |
| HSIDU10 | 866596 | 876 | 566 - 811 | 2136 |  |  | H0036: 1   |  |  |
| HSIDS63 | 745340 | 877 | 211 - 291 | 2137 |  |  | L0581: 2 and H0036: 1.   |  |  |
| HSIDQ95 | 795033 | 878 | 20 - 358  | 2138 | Arg-1 to Asp-13,<br>Glu-17 to Gln-29,<br>Pro-58 to Gly-64,<br>Pro-80 to His-89,<br>Lys-100 to Lys-107. |  | H0036: 1, L0748: 1 and L0747: 1.   |  |  |
| HSIDH25 | 679296 | 879 | 137 - 229 | 2139 |  |  | L0439: 2 and   |  |  |

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| HSIDD63 | 559788 | 880 | 147 - 401 | 2140 | Glu-14 to Met-25,<br>Leu-29 to Lys-35,<br>Ser-42 to Glu-47. | H0036: 1.  |  |  |
| HSIDC85 | 783403 | 881 | 354 - 617 | 2141 | Lys-1 to Leu-21.  | H0036: 1 and<br>L0749: 1.                          |  |  |
| HSIDB51 | 725888 | 882 | 129 - 296 | 2142 |   | H0036: 1 and<br>L0748: 1.                          |  |  |
| HSIDA48 | 721885 | 883 | 2 - 169   | 2143 | Thr-35 to Val-41,<br>Thr-47 to His-53.                      | L0599: 2 and<br>H0036: 1.                          |  |  |
| HSICV38 | 827957 | 884 | 105 - 386 | 2144 | Asp-17 to Gly-25.   | H0036: 1 and<br>L0759: 1.                          |  |  |
| HSICU58 | 507172 | 885 | 166 - 363 | 2145 |   | AR050: 1, AR054:<br>0                              |  |  |
| HSICQ22 | 675004 | 886 | 296 - 490 | 2146 | Gly-14 to His-20.   | H0036: 1<br>L0748: 2, H0036:<br>1 and L0758: 1.    |  |  |
| HSICP86 | 785733 | 887 | 55 - 339  | 2147 |   | AR089: 1, AR061:<br>0<br>L0748: 2 and<br>H0036: 1. |  |  |
| HSICP22 | 586284 | 888 | 1 - 327   | 2148 | Pro-26 to Tyr-37.   | AR054: 11,<br>AR050: 1, AR051:<br>1<br>H0036: 1    |  |  |
| HSIBB22 | 518673 | 889 | 32 - 160  | 2149 |   | H0037: 1   |  |  |
| HSIAQ22 | 505052 | 890 | 222 - 365 | 2150 | Ser-9 to Met-14.  | H0036: 1 and<br>L0665: 1.                          |  |  |

|         | 510961 | 1265 | 366 - 256 | 2525 | Ser-8 to Ser-14,<br>Pro-19 to Cys-26. |                                     |           |  |
|---------|--------|------|-----------|------|---------------------------------------|-------------------------------------|-----------|--|
| HSIAL16 | 496026 | 891  | 535 - 672 | 2151 | Leu-7 to Leu-13.                      | L0748: 2 and<br>H0036: 1.           |           |  |
|         | 866631 | 1266 | 208 - 366 | 2526 |                                       |                                     |           |  |
|         | 522231 | 892  | 203 - 367 | 2152 | Val-20 to Ser-25.                     |                                     |           |  |
| HSIAI62 |        |      |           |      |                                       | H0036: 1                            |           |  |
| HSIAI37 | 698015 | 893  | 2 - 73    | 2153 |                                       | H0036: 1                            |           |  |
| HSIAI03 | 960907 | 894  | 337 - 125 | 2154 | Leu-1 to Lys-20.                      | L0771: 2, H0036:<br>1 and L0761: 1. |           |  |
|         |        |      |           |      |                                       |                                     |           |  |
| HSIAD11 | 964915 | 895  | 2 - 139   | 2155 | Arg-22 to Asp-37.                     |                                     |           |  |
| HSIAB63 | 745637 | 896  | 100 - 333 | 2156 | Glu-23 to Glu-32.                     | L0596: 2, L0604:<br>2 and H0036: 1. |           |  |
| HSIAB05 | 932922 | 897  | 228 - 386 | 2157 |                                       | H0036: 1 and<br>L0608: 1.           |           |  |
| HSGBB01 | 916772 | 898  | 221 - 406 | 2158 |                                       | H0447: 1, L0752:<br>1 and L0608: 1. | 14q12-q13 | 135750,<br>160760,<br>160760,<br>182600,<br>600243,<br>600635,<br>600792,<br>601369,<br>602086,<br>602279,<br>602279 |
|         |        |      |           |      |                                       |                                     |           |  |
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|         |        |      |           |      |                                       |                                     |           |  |
|         |        |      |           |      |                                       |                                     |           |  |
| HSGAA12 | 971541 | 899  | 181 - 417 | 2159 | Gly-2 to Arg-8,<br>Ile-36 to Glu-41.  | H0035: 1 and<br>L0766: 1.           |           |  |

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| HRTAR64 | 575020 | 900  | 78 - 248  | 2160 | Leu-40 to Arg-48.                                    | L0742: 2 and T0008: 1.                      |    |  |
| HRTAR31 | 698417 | 901  | 176 - 322 | 2161 | Lys-4 to Ile-10.                                     | T0008: 1 and L0756: 1.                      |    |  |
| HRTAP73 | 560932 | 902  | 201 - 61  | 2162 | Phe-31 to Thr-42.                                    | T0008: 1                                    |    |  |
|         | 867011 | 1267 | 266 - 499 | 2527 | Glu-29 to Thr-35.                                    |   |    |  |
| HRTAN72 | 766328 | 903  | 3 - 260   | 2163 | Pro-25 to Val-30.                                    | T0008: 1                                    |    |  |
| HRTAN70 | 524889 | 904  | 24 - 230  | 2164 |  | T0008: 1                                    |    |  |
| HRTAN65 | 753913 | 905  | 154 - 480 | 2165 | Lys-62 to Lys-69.                                    | T0008: 1, L0740: 1 and L0745: 1.            |    |  |
| HRTAN23 | 675124 | 906  | 101 - 208 | 2166 |  | T0008: 1 and L0748: 1.                      |    |  |
| HRTAE57 | 871385 | 907  | 165 - 401 | 2167 |  | L0748: 2, T0008: 1 and L0754: 1.            |    |  |
| HRTAD37 | 708782 | 908  | 220 - 423 | 2168 | Cys-38 to Thr-46, Lys-54 to Cys-61.                  | T0008: 1, L0471: 1, L0748: 1 and L0749: 1.  |    |  |
| HROEA53 | 838825 | 909  | 12 - 323  | 2169 |  | H0598: 1 and L0439: 1.                      |    |  |
| HROEA06 | 934673 | 910  | 93 - 254  | 2170 |  | L0439: 3, L0745: 2 and H0598: 1.            |    |  |
| HRODY95 | 838830 | 911  | 211 - 333 | 2171 |  | H0598: 1 and L0754: 1.                      | 20 |  |
| HRODX43 | 949765 | 912  | 10 - 198  | 2172 | Leu-2 to Ile-14.                                     | H0598: 1 and L0756: 1.                      |    |  |
| HRODU82 | 779482 | 913  | 5 - 565   | 2173 | Ser-4 to Ser-12, Ser-30 to Trp-36, Ser-59 to Asn-67, | L0748: 54, L0581: 3, H0598: 1 and L0756: 1. |    |  |



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| HROBL46 | 718638 | 926 | 87 - 218  | 2186 | Trp-2 to Met-7.                        | L0744: 1.                 |  |  |
| HROBH25 | 677574 | 927 | 390 - 542 | 2187 |  | H0598: 1 and<br>L0748: 1. |  |  |
| HROBG67 | 751230 | 928 | 120 - 293 | 2188 |  | H0598: 1 and<br>L0741: 1. |  |  |
| HROBF19 | 668013 | 929 | 191 - 430 | 2189 | Ser-19 to Gln-25.                      | H0598: 1 and<br>L0748: 1. |  |  |
| HROBD79 | 774558 | 930 | 479 - 655 | 2190 | Thr-15 to Ser-21.                      | H0598: 1.                 |  |  |
| HROAZ07 | 973603 | 931 | 5 - 514   | 2191 |  | AR089: 1, AR061:<br>0     |  |  |
| HROAW79 | 774604 | 932 | 265 - 459 | 2192 |  | H0316: 1                  |  |  |
| HROAV11 | 966329 | 933 | 22 - 189  | 2193 | Lys-1 to Leu-6,<br>Gln-9 to Lys-20.    | H0316: 1 and<br>L0754: 1. |  |  |
| HROAU03 | 923381 | 934 | 205 - 339 | 2194 |  | H0316: 1 and<br>L0751: 1. |  |  |
| HROAS95 | 795621 | 935 | 119 - 304 | 2195 | Gly-25 to Lys-32.                      | H0316: 1 and<br>L0596: 1. |  |  |
| HROAS28 | 685982 | 936 | 248 - 382 | 2196 |  | H0316: 1 and<br>L0748: 1. |  |  |
| HROAQ54 | 729168 | 937 | 246 - 353 | 2197 |  | H0316: 1 and<br>L0748: 1. |  |  |
| HROAL96 | 867080 | 938 | 64 - 318  | 2198 | Pro-15 to Gln-20,<br>Ile-37 to Trp-47. | H0316: 1                  |  |  |

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| HROAJ83 | 781394 | 939 | 157 - 378 | 2199 |  | H0316: 1 and<br>L0748: 1.                          |  |  |
| HROAI61 | 742084 | 940 | 1 - 609   | 2200 |  | AR089: 4, AR061:<br>3<br>H0316: 1 and<br>L0747: 1. |  |  |
| HROAG39 | 526488 | 941 | 23 - 154  | 2201 |  | H0316: 1   |  |  |
| HROAF96 | 830769 | 942 | 90 - 266  | 2202 | Met-29 to Glu-46.  | H0316: 1 and<br>L0439: 1.                          |  |  |
| HROAE84 | 881995 | 943 | 294 - 617 | 2203 |  | H0316: 1   |  |  |
| HROAD39 | 597055 | 944 | 7 - 237   | 2204 | Thr-23 to Glu-28.  | H0316: 1 and<br>L0754: 1.                          |  |  |
| HROAD06 | 954694 | 945 | 126 - 443 | 2205 | Glu-11 to Ser-19.  | L0748: 2 and<br>H0316: 1.                          |  |  |
| HPASF63 | 745524 | 946 | 98 - 217  | 2206 |  | H0270: 1 and<br>L0748: 1.                          |  |  |
| HPASE19 | 672016 | 947 | 70 - 258  | 2207 |  | H0270: 1 and<br>L0439: 1.                          |  |  |
| HOCNF65 | 859585 | 948 | 217 - 405 | 2208 | Gly-12 to Thr-19.  | L0438: 2, L0742:<br>2, L0439: 2 and<br>S0442: 1.   |  |  |
| HNSMD08 | 958337 | 949 | 251 - 499 | 2209 |  | S0436: 1 and<br>L0462: 1.                          |  |  |
| HNSMC05 | 840216 | 950 | 255 - 554 | 2210 | Ser-25 to Gln-30,<br>His-38 to Asn-43.                       | L0753: 1 and<br>S0436: 1.                          |  |  |
| HNSAA51 | 971484 | 951 | 4 - 612   | 2211 | Thr-1 to Gly-16;<br>Gln-43 to Glu-50,<br>Ser-136 to Gly-153, | AR089: 225,<br>AR061: 197,<br>AR050: 118,          |  |  |

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| HNKCM03  | 922136 | 952 | 61 - 252  | 2212 | Asn-169 to Phe-174,<br>Thr-182 to Gln-188.                                       | AR054: 115,<br>AR051: 92<br>L0768: 1, L0666:<br>1 and S0434: 1.                        |  |  |
| HNKAZ51  | 947067 | 953 | 31 - 612  | 2213 | Arg-11 to Arg-18,<br>Gln-96 to Gln-102,<br>Gln-121 to Gln-128.                   | AR050: 2, AR061:<br>1, AR089: 0,<br>AR054: 0, AR051:<br>0<br>L0015: 1 and<br>S0330: 1. |  |  |
| HNKAO08  | 955691 | 954 | 177 - 416 | 2214 | Lys-12 to Arg-19,<br>Glu-26 to Ser-33,<br>Asp-44 to Asn-49,<br>Arg-68 to Arg-76. | S0330: 1 and<br>L0756: 1.  |  |  |
| HNKAB83  | 914959 | 955 | 318 - 476 | 2215 |  | S0330: 1 and<br>L0745: 1.  |  |  |
| HNJDR12  | 968978 | 956 | 174 - 461 | 2216 | Val-20 to Arg-31,<br>Gly-52 to Asn-59.   | L0757: 4 and<br>S0328: 1.  |  |  |
| HNJCE58  | 927451 | 957 | 261 - 458 | 2217 |  | S0328: 1, L0745:<br>1 and L0731: 1.  |  |  |
| HNJB Y05 | 928680 | 958 | 134 - 301 | 2218 | Lys-9 to Phe-14.   | S0328: 1 and<br>L0748: 1.  |  |  |
| HNALB40  | 507439 | 959 | 350 - 481 | 2219 |  | H0380: 1 and<br>L0581: 1.  |  |  |
| HNALB10  | 968198 | 960 | 1 - 150   | 2220 | Met-17 to Leu-40.  | H0380: 1, L0776:<br>1 and L0759: 1.  |  |  |
| HNAAE09  | 888913 | 961 | 239 - 460 | 2221 | Glu-24 to Asp-31.  | AR054: 16,   |  |  |

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|         |        |     |           |      |  |  |  | AR050: 9, AR051:<br>3<br>H0379: 1                             |        |   |
| HMZME85 | 861084 | 962 | 176 - 550 | 2222 |  |  |  | L0364: 1, S0350:<br>1 and L0740: 1.                           | 1q25.1 | 145001,<br>150292,<br>208250,<br>600995,<br>601652            |
| HMZME57 | 734417 | 963 | 159 - 308 | 2223 |  |  |  | S0350: 1 and<br>L0603: 1.                                     |        |   |
| HMZMD49 | 722624 | 964 | 255 - 443 | 2224 |  |  | Ile-1 to Asn-6.                        | S0350: 1 and<br>L0747: 1.                                     |        |   |
| HMZAE53 | 868116 | 965 | 1 - 315   | 2225 |  |  |  | L0362: 4 and<br>S0332: 1.                                     |        |   |
| HMZAC09 | 625188 | 966 | 198 - 632 | 2226 |  |  | Trp-1 to Phe-8,<br>Ala-94 to Trp-108.  | S0332: 1 and<br>L0758: 1.                                     |        |   |
| HMZAA34 | 703755 | 967 | 486 - 626 | 2227 |  |  | Ile-29 to Ile-35.                      | L0754: 2, L0662:<br>1 and S0332: 1.                           |        |   |
| HLXN18  | 973906 | 968 | 203 - 403 | 2228 |  |  | Pro-34 to Trp-41,<br>Arg-43 to Thr-50. | S0448: 1  |        |   |
| HLXNB04 | 926933 | 969 | 89 - 298  | 2229 |  |  | Arg-34 to Ser-43.                      | L0748: 3 and<br>S0448: 1.                                     | 3q     |   |
| HLQIF28 | 856619 | 970 | 1 - 306   | 2230 |  |  | Arg-36 to Leu-45.                      | AR089: 10,<br>AR061: 8<br>L0581: 3, H0632:<br>1 and L0748: 1. | 20p12  | 112261,<br>176640,<br>176640,<br>176640,<br>236700,<br>601920 |
| HLQHD03 | 856624 | 971 | 33 - 266  | 2231 |  |  | Pro-1 to Phe-7,                        | L0751: 2 and  |        |   |

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|         |        |     |           |      |  | Gln-26 to Gly-32,<br>Ile-52 to Pro-67. |  |  | H0632: 1.  |  |  |
| HLQGZ73 | 856638 | 972 | 169 - 282 | 2232 |  | Arg-1 to Pro-10.                       |  |  | L0745: 2, L0731:<br>2 and H0632: 1.                        |  |  |
| HLQGU11 | 965781 | 973 | 691 - 873 | 2233 |  |  |  |  | H0632: 1, L0800:<br>1, L0438: 1, L0748:<br>1 and L0759: 1. |  |  |
| HLQGP25 | 893692 | 974 | 357 - 524 | 2234 |  |  |  |  | H0632: 1   |  |  |
| HLQGP12 | 969516 | 975 | 718 - 918 | 2235 |  | Glu-14 to Ile-20.                      |  |  | L0748: 3, L0749:<br>2, H0632: 1 and<br>L0455: 1.           |  |  |
| HLQGA01 | 915066 | 976 | 53 - 313  | 2236 |  | Arg-78 to Tyr-84.                      |  |  | L0749: 2, H0632:<br>1 and L0748: 1.                        |  |  |
| HLQFS05 | 928264 | 977 | 3 - 134   | 2237 |  | Ala-22 to Thr-39.                      |  |  | H0574: 1 and<br>L0600: 1.                                  |  |  |
| HLQFQ08 | 961154 | 978 | 411 - 94  | 2238 |  | Ser-87 to Met-93.                      |  |  | H0574: 1, L0639:<br>1 and L0776: 1.                        |  |  |
| HLQFE53 | 856700 | 979 | 420 - 869 | 2239 |  |  |  |  | H0574: 1 and<br>L0758: 1.                                  |  |  |
| HLQEW11 | 966019 | 980 | 2 - 172   | 2240 |  | Tyr-18 to Gln-23,<br>Glu-28 to Phe-33. |  |  | L0757: 2, H0574:<br>1, L0761: 1 and<br>L0664: 1.           |  |  |
| HLQEN12 | 969694 | 981 | 330 - 539 | 2241 |  |  |  |  | H0574: 1 and<br>L0666: 1.                                  |  |  |
| HLQEN07 | 856733 | 982 | 46 - 141  | 2242 |  |  |  |  | H0574: 1 and<br>L0547: 1.                                  |  |  |
| HLQEM06 | 934078 | 983 | 119 - 244 | 2243 |  |  |  |  | H0574: 1 and<br>L0662: 1.                                  |  |  |

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| HLQED04 | 969543 | 984 | 3 - 227   | 2244 |   | H0574: 1 and<br>L0581: 1.           |  |  |
| HLQDV62 | 743401 | 985 | 2 - 136   | 2245 | His-40 to Lys-45.   | H0574: 1 and<br>L0744: 1.           |  |  |
| HLQDV01 | 916190 | 986 | 182 - 415 | 2246 |   | H0574: 1, L0748:<br>1 and L0779: 1. |  |  |
| HLQDU64 | 746435 | 987 | 257 - 445 | 2247 | Arg-20 to Ala-37.   | H0574: 1 and<br>L0743: 1.           |  |  |
| HLQDT89 | 786115 | 988 | 577 - 816 | 2248 |   | L0748: 4 and<br>H0574: 1.           |  |  |
| HLQDR89 | 972425 | 989 | 140 - 262 | 2249 | Ser-6 to Ser-12.  | H0574: 1                            |  |  |
| HLQDR47 | 720145 | 990 | 3 - 155   | 2250 | Ala-18 to Ser-23,<br>Ser-39 to Gly-45.  | H0574: 1 and<br>L0754: 1.           |  |  |
| HLQDR15 | 660003 | 991 | 268 - 498 | 2251 |   | H0574: 1 and<br>L0749: 1.           |  |  |
| HLQDQ72 | 973258 | 992 | 1 - 243   | 2252 | Arg-9 to Thr-18,<br>Pro-25 to Glu-33,<br>Ser-67 to Ile-72,<br>Pro-74 to Cys-79. | H0574: 1                            |  |  |
| HLQDP33 | 702276 | 993 | 125 - 286 | 2253 | His-1 to Phe-6,<br>Leu-28 to Ile-33.  | H0574: 1 and<br>L0596: 1.           |  |  |
| HLQDM72 | 761347 | 994 | 150 - 284 | 2254 | Leu-30 to Trp-36.   | H0574: 1 and<br>L0748: 1.           |  |  |
| HLQDM03 | 923862 | 995 | 85 - 180  | 2255 |   | H0574: 1 and<br>L0747: 1.           |  |  |
| HLQDJ01 | 916193 | 996 | 292 - 480 | 2256 |   | H0574: 1 and<br>L0766: 1.           |  |  |
| HLQDI75 | 856759 | 997 | 118 - 324 | 2257 | Val-14 to Arg-24,   | H0574: 1                            |  |  |

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| HLQDF69  | 754302 | 998  | 228 - 419 | 2258 | Arg-31 to Asp-41.  |  |  |  |  |
| HLQDF27  | 682896 | 999  | 5 - 238   | 2259 | Lys-1 to Trp-9.<br>Pro-1 to Ala-8,<br>Gln-27 to Gly-32,<br>Val-37 to Gly-46,<br>Leu-59 to Ala-66,<br>Leu-73 to Gly-78. | H0574: 1<br>H0574: 1                               |  |  |  |
| HLQDE32  | 707639 | 1000 | 348 - 578 | 2260 |  | AR061: 7, AR089:<br>3<br>H0574: 1 and<br>L0439: 1. |  |  |  |
| HLQDC02  | 919611 | 1001 | 24 - 233  | 2261 | Arg-10 to Ser-15,<br>Arg-31 to Ala-36,<br>Arg-64 to Gly-70.  | L0757: 2, H0574:<br>1 and L0021: 1.                |  |  |  |
| HLQDB69  | 934462 | 1002 | 3 - 506   | 2262 | Glu-1 to Ala-7,<br>Pro-16 to Asp-22,<br>Gln-27 to Glu-35.  | H0574: 1 and<br>L0745: 1.                          |  |  |  |
| HLQCZ83  | 781052 | 1003 | 199 - 354 | 2263 |  | H0574: 1 and<br>L0749: 1.                          |  |  |  |
| HLQCZ46  | 871684 | 1004 | 396 - 91  | 2264 | Ser-7 to Thr-12.   | L0439: 5, L0438:<br>3 and H0574: 1.                |  |  |  |
| HLQCY79  | 774827 | 1005 | 346 - 489 | 2265 |  | L0748: 9 and<br>H0574: 1.                          |  |  |  |
| HLQCS58  | 735841 | 1006 | 3 - 134   | 2266 | Arg-6 to Ser-14.   | H0574: 1 and<br>L0777: 1.                          |  |  |  |
| HLQCCQ09 | 625412 | 1007 | 1 - 144   | 2267 |  | L0748: 2, H0574:<br>1 and L0777: 1.                |  |  |  |
| HLQCP89  | 689673 | 1008 | 583 - 762 | 2268 |  | L0748: 2, H0574:                                   |  |  |  |



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| HLQCO19 | 668521 | 1009 | 2 - 337   | 2269 |   |  | 1 and L0749: 1.                                  |   |  |
| HLQCK45 | 488499 | 1010 | 119 - 373 | 2270 | Lys-47 to Lys-53.   |  | L0748: 2 and<br>H0574: 1.                        |   |  |
| HLQCI96 | 823602 | 1011 | 135 - 401 | 2271 | Glu-47 to Gly-53,<br>Arg-55 to Val-64,<br>Leu-69 to His-78. |  | L0748: 3, L0758:<br>2, H0574: 1 and<br>L0591: 1. |   |  |
| HLQCH67 | 751481 | 1012 | 91 - 282  | 2272 | Glu-35 to Tyr-42,<br>His-58 to Asn-64.                      |  | H0574: 1 and<br>L0748: 1.                        | 6 |  |
| HLQBS59 | 566772 | 1013 | 290 - 568 | 2273 |   |  | L0748: 2 and<br>H0574: 1.                        |   |  |
| HLQBQ19 | 868282 | 1268 | 276 - 560 | 2528 |   |  | AR050: 10,<br>AR054: 3, AR051:<br>1              |   |  |
|         | 671928 | 1014 | 171 - 299 | 2274 |   |  | H0331: 1   |   |  |
| HLQBF91 | 790408 | 1015 | 222 - 329 | 2275 |   |  | H0331: 1 and<br>L0748: 1.                        |   |  |
| HLQBD38 | 948694 | 1016 | 34 - 192  | 2276 | Gln-25 to Gly-35.   |  | H0331: 1 and<br>L0758: 1.                        |   |  |
| HLQAX31 | 693626 | 1017 | 363 - 599 | 2277 |   |  | L0756: 2 and<br>H0331: 1.                        |   |  |
| HLQAP90 | 787240 | 1018 | 289 - 107 | 2278 | Glu-24 to Leu-31,<br>Thr-34 to Gly-44.                      |  | H0331: 1 and<br>L0599: 1.                        |   |  |
| HLQAO31 | 698385 | 1019 | 25 - 204  | 2279 |   |  | H0331: 1 and<br>L0748: 1.                        |   |  |

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| HLQAN75 | 880815 | 1020 | 195 - 479 | 2280 | Arg-27 to Gly-32.  | L0748: 4 and<br>H0331: 1.                        |  |  |
| HLPBA84 | 912828 | 1021 | 349 - 549 | 2281 |  | H0349: 1 and<br>L0749: 1.                        |  |  |
| HLICU57 | 871716 | 1022 | 2 - 238   | 2282 | Ser-1 to Lys-7,<br>Thr-19 to Glu-24.                       | H0355: 1 and<br>L0749: 1.                        |  |  |
| HLICS57 | 734450 | 1023 | 13 - 276  | 2283 | Arg-14 to His-26,<br>Gly-63 to Arg-70.                     | H0355: 1 and<br>L0731: 1.                        |  |  |
| HLICR28 | 686132 | 1024 | 2 - 235   | 2284 | Asn-7 to Ser-13,<br>Asn-25 to Lys-35,<br>Thr-67 to Ser-72. | H0355: 1 and<br>L0749: 1.                        |  |  |
| HLICP76 | 825536 | 1025 | 300 - 518 | 2285 |  | L0744: 3, H0355:<br>1 and L0756: 1.              |  |  |
| HLICO07 | 952625 | 1026 | 344 - 493 | 2286 | Gly-1 to Thr-7,<br>Gln-21 to Glu-29.                       | L0594: 2, H0355:<br>1, L0761: 1 and<br>L0803: 1. |  |  |
| HLICL82 | 779576 | 1027 | 3 - 203   | 2287 | Asp-1 to Gly-6.  | H0355: 1 and<br>L0748: 1.                        |  |  |
| HLICJ60 | 739746 | 1028 | 170 - 349 | 2288 |  | L0749: 2, H0355:<br>1 and L0748: 1.              |  |  |
| HLIBZ10 | 963973 | 1029 | 99 - 338  | 2289 | Lys-30 to Val-35.  | H0355: 1 and<br>L0748: 1.                        |  |  |
| HLIBK17 | 662438 | 1030 | 249 - 416 | 2290 | Ser-3 to Ser-19.   | H0355: 1 and<br>L0439: 1.                        |  |  |
| HLIBB54 | 782180 | 1031 | 3 - 260   | 2291 | Pro-1 to Arg-9.  | H0355: 1 and<br>L0750: 1.                        |  |  |
| HLDR792 | 791215 | 1032 | 209 - 412 | 2292 |  | L0748: 2 and<br>H0510: 1.                        |  |  |

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| HLD RP58 | 735731 | 1033 | 452 - 634 | 2293 | Pro-16 to Asp-24.                      | H0510: 1 and<br>L0753: 1.                        |   |          |
| HLDQV07  | 952691 | 1034 | 282 - 452 | 2294 |  | H0510: 1, L0438:<br>1 and L0439: 1.              |   |          |
| HLDQN90  | 857062 | 1035 | 12 - 161  | 2295 | Glu-24 to Arg-33,<br>Cys-37 to Val-42. | H0510: 1 and<br>L0759: 1.                        |   |          |
| HLDQH68  | 835571 | 1036 | 290 - 499 | 2296 | Pro-17 to Arg-27,<br>Val-52 to Glu-61. | H0510: 1 and<br>L0589: 1.                        |   |          |
| HLDQD92  | 552019 | 1037 | 3 - 218   | 2297 |  | L0748: 2 and<br>H0510: 1.                        |   |          |
| HLDQC57  | 734475 | 1038 | 33 - 230  | 2298 |  | L0758: 2 and<br>H0510: 1.                        |   |          |
| HLDPE31  | 697969 | 1039 | 90 - 221  | 2299 | Thr-25 to Thr-30,<br>Pro-32 to Phe-37. | L0748: 2, L0749:<br>2, H0510: 1 and<br>L0809: 1. | 109565,<br>109565,<br>142640,<br>165500,<br>228960,<br>261515,<br>600044,<br>600700 | 3q27-q28 |
| HLDX46   | 719023 | 1040 | 73 - 249  | 2300 | Asn-3 to Thr-8,<br>Gly-21 to Lys-35.   | L0741: 2, H0510:<br>1 and L0592: 1.              |   |          |
| HLDOT85  | 784331 | 1041 | 244 - 480 | 2301 | Arg-44 to Gly-50.                      | H0510: 1 and<br>L0439: 1.                        |   |          |
| HLDOS76  | 770016 | 1042 | 320 - 439 | 2302 | His-1 to Trp-7,<br>Gln-18 to Thr-25.   | H0510: 1 and<br>L0581: 1.                        |   |          |
| HLDOM43  | 715254 | 1043 | 263 - 466 | 2303 |  | L0748: 2, H0510:<br>1 and L0805: 1.              |   |          |

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| HLDOK25  | 678063 | 1044 | 2 - 253   | 2304 |  | H0510: 1 and L0483: 1.           |  |  |
| HLDOE06  | 922162 | 1045 | 153 - 1   | 2305 | Gly-7 to His-17.   | H0510: 1, L0372: 1 and L0766: 1. |  |  |
| HLDOD83  | 724046 | 1046 | 649 - 167 | 2306 |  | L0748: 2, H0510: 1 and L0581: 1. |  |  |
| HLD0C67  | 689240 | 1047 | 69 - 332  | 2307 | Thr-32 to Trp-41, Arg-55 to Tyr-61, Asp-83 to Gly-88.                  | H0510: 1 and L0600: 1.           |  |  |
| HILDNR75 | 767294 | 1048 | 155 - 310 | 2308 | Arg-12 to Met-20, Gln-34 to Arg-52.                                    | H0510: 1 and L0748: 1.           |  |  |
| HILDNR54 | 729853 | 1049 | 121 - 321 | 2309 | Gln-62 to Lys-67.  | H0510: 1                         |  |  |
| HILDNL92 | 792694 | 1050 | 48 - 218  | 2310 | Phe-8 to Asp-14, Pro-39 to Lys-57.                                     | H0510: 1 and L0748: 1.           |  |  |
| HILDNL57 | 963552 | 1051 | 1 - 360   | 2311 | Glu-1 to Ala-12, Asp-75 to Trp-80.                                     | L0731: 2 and H0510: 1.           |  |  |
| HLDDY07  | 952751 | 1052 | 187 - 357 | 2312 |  | H0509: 1 and L0748: 1.           |  |  |
| HLDDS06  | 934929 | 1053 | 74 - 244  | 2313 | Gln-6 to Trp-30, Thr-41 to Asn-57.                                     | H0509: 1 and L0794: 1.           |  |  |
| HLDCW15  | 705466 | 1054 | 222 - 413 | 2314 |  | L0748: 4 and H0509: 1.           |  |  |
| HLDCU74  | 765307 | 1055 | 3 - 239   | 2315 | Arg-5 to Phe-20, Glu-27 to Leu-37, Glu-51 to Glu-58, Lys-69 to Asp-79. | H0509: 1 and L0743: 1.           |  |  |
| HLDCE01  | 916444 | 1056 | 156 - 308 | 2316 |  | H0509: 1 and L0779: 1.           |  |  |

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| HLDBW64 | 746545 | 1057 | 356 - 183 | 2317 | Pro-23 to Thr-34.  | H0509: 1 and<br>L0748: 1.                        |   |  |
| HLDBV65 | 764915 | 1058 | 193 - 402 | 2318 |  | AR089: 23,<br>AR061: 7<br>H0509: 1               | 5 |  |
| HLDBT71 | 760347 | 1059 | 464 - 691 | 2319 | Leu-22 to Asn-27.  | L0748: 3, L0596:<br>2, H0509: 1 and<br>L0749: 1. |   |  |
| HLDBN55 | 731734 | 1060 | 252 - 599 | 2320 | Pro-4 to Ser-9,<br>Arg-11 to Phe-18,<br>Val-22 to Phe-46.  | H0509: 1 and<br>L0596: 1.                        |   |  |
| HLDBN38 | 678424 | 1061 | 71 - 232  | 2321 | Gly-5 to Pro-11,<br>Ala-17 to Gly-35,<br>Ile-39 to Arg-44.   | H0509: 1, L0438:<br>1 and L0439: 1.              |   |  |
| HLDBN03 | 924100 | 1062 | 413 - 811 | 2322 | Leu-11 to Glu-17.  | L0439: 4, H0509:<br>1, L0748: 1 and<br>L0777: 1. |   |  |
| HLDBI09 | 625542 | 1063 | 185 - 448 | 2323 | Pro-26 to Ala-39.  | H0509: 1 and<br>L0749: 1.                        |   |  |
| HLDBE09 | 625554 | 1064 | 3 - 158   | 2324 | Pro-6 to His-13.   | H0509: 1   |   |  |
| HLDBD09 | 625551 | 1065 | 85 - 423  | 2325 | Ala-41 to Gly-63.  | H0509: 1   |   |  |
| HLDBD02 | 920039 | 1066 | 17 - 328  | 2326 | His-1 to Arg-7,<br>Val-14 to Gly-22,<br>Gln-29 to Arg-36,<br>Pro-58 to Gly-64,<br>Lys-84 to Ser-100. | H0509: 1   |   |  |
| HLDBC10 | 964582 | 1067 | 287 - 466 | 2327 | Ala-1 to Tyr-6,<br>Asp-13 to Ser-18,<br>Leu-21 to Val-27.  | H0509: 1   |   |  |

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| HLDBB21 | 713680 | 1068 | 2 - 376   | 2328 | Ser-7 to Asp-15,<br>Leu-24 to Leu-29,<br>Thr-116 to Ile-122. | AR089: 27,<br>AR061: 19<br>H0509: 1 | 16p11.2  | 147781,<br>172471,<br>182381 |
| HLDBB08 | 959385 | 1069 | 1 - 117   | 2329 | Ala-1 to Cys-8.  | H0509: 1                            |          |                              |
| HLDAV58 | 736027 | 1070 | 203 - 361 | 2330 |  | L0756: 3 and<br>H0509: 1.           |          |                              |
| HLDAV38 | 709140 | 1071 | 147 - 344 | 2331 | Val-1 to Tyr-6.  | H0509: 1                            |          |                              |
| HLDAV13 | 657191 | 1072 | 224 - 439 | 2332 | Ala-1 to Asp-8,<br>Thr-27 to Arg-33.                         | H0509: 1                            |          |                              |
| HLDAV01 | 916462 | 1073 | 3 - 185   | 2333 | Met-35 to Gln-41.  | H0509: 1                            |          |                              |
| HLDAV12 | 970634 | 1074 | 163 - 324 | 2334 | Gln-47 to Cys-53.  | H0509: 1 and<br>L0439: 1.           |          |                              |
| HLDAK33 | 857107 | 1075 | 2 - 286   | 2335 |  | L0617: 1 and<br>H0509: 1.           | 22q11.23 | 123620,<br>600850            |
| HLDAJ38 | 709138 | 1076 | 360 - 476 | 2336 |  | H0509: 1 and<br>L0748: 1.           |          |                              |
| HLDA31  | 586638 | 1077 | 2 - 235   | 2337 |  | H0509: 1                            |          |                              |
| HKCTA23 | 877228 | 1078 | 171 - 305 | 2338 | Phe-9 to Tyr-21.   | L0754: 2 and<br>H0205: 1.           |          |                              |
| HISET33 | 974559 | 1079 | 98 - 430  | 2339 | Gly-47 to Ser-65.  | H0539: 1                            |          |                              |
| HISEQ03 | 923095 | 1080 | 227 - 412 | 2340 | Ser-37 to His-45.  | H0539: 1 and<br>L0748: 1.           |          |                              |
| HISEI01 | 915375 | 1081 | 2 - 397   | 2341 | Leu-1 to Asn-9,<br>His-51 to Asp-58,<br>Pro-86 to Thr-97.    | H0539: 1 and<br>L0748: 1.           |          |                              |
| HISEF78 | 841308 | 1082 | 442 - 762 | 2342 |  | H0539: 1 and<br>L0362: 1.           |          |                              |
| HISDW49 | 928682 | 1083 | 991 - 149 | 2343 | Asp-21 to Gly-26.  | AR089: 5, AR061:                    |          |                              |

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| HISDQ54 | 843345 | 1084 | 268 - 663  | 2344 | Glu-38 to Pro-43.   |  |  |  | H0539: 1 and<br>L0596: 1.           |  |  |  |
| HISDL84 | 782286 | 1085 | 210 - 1    | 2345 | Lys-60 to Asn-70.   |  |  |  | H0539: 1 and<br>L0439: 1.           |  |  |  |
| HISDF08 | 958417 | 1086 | 3 - 470    | 2346 | Asn-10 to Arg-15,<br>Arg-41 to Gly-48.                      |  |  |  | L0369: 1, H0539:<br>1 and L0608: 1. |  |  |  |
| HISCQ82 | 975205 | 1087 | 474 - 710  | 2347 | Ala-13 to Ser-22.   |  |  |  | H0539: 1                            |  |  |  |
| HISCO10 | 964285 | 1088 | 197 - 409  | 2348 |   |  |  |  | H0539: 1                            |  |  |  |
| HISCN94 | 794189 | 1089 | 200 - 760  | 2349 | Glu-6 to Glu-19.  |  |  |  | H0539: 1, L0439:<br>1 and L0756: 1. |  |  |  |
| HISCH73 | 764281 | 1090 | 173 - 376  | 2350 | Gly-16 to Val-22.   |  |  |  | H0539: 1 and<br>L0605: 1.           |  |  |  |
| HISCG55 | 731544 | 1091 | 723 - 1094 | 2351 |   |  |  |  | L0439: 6, L0593:<br>2 and H0539: 1. |  |  |  |
| HISCF69 | 882055 | 1092 | 1 - 405    | 2352 | Thr-41 to Ala-48,<br>Arg-57 to Gly-68,<br>Pro-91 to Gly-98. |  |  |  | L0385: 1 and<br>H0539: 1.           |  |  |  |
| HISCF31 | 950628 | 1093 | 137 - 424  | 2353 | Asn-37 to Leu-52,<br>Asn-79 to Ser-86.                      |  |  |  | H0539: 1 and<br>L0749: 1.           |  |  |  |
| HISBZ83 | 781018 | 1094 | 161 - 433  | 2354 | Gly-81 to Lys-91.   |  |  |  | L0766: 1, H0539:<br>1 and L0602: 1. |  |  |  |
| HISBW78 | 840252 | 1095 | 164 - 349  | 2355 | Gln-31 to Asp-37.   |  |  |  | L0622: 1 and<br>H0539: 1.           |  |  |  |
| HISBV60 | 740184 | 1096 | 106 - 255  | 2356 | Asp-44 to Thr-50.   |  |  |  | H0539: 1 and<br>L0362: 1.           |  |  |  |

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| HISBV54 | 729356 | 1097 | 288 - 1   | 2357 | Thr-30 to Trp-35.   | H0539: 1 and<br>L0589: 1.           |         |  |
| HISBU75 | 767166 | 1098 | 155 - 295 | 2358 | Tyr-7 to Ser-13.  | H0539: 1 and<br>L0747: 1.           |         |  |
| HISBS95 | 795748 | 1099 | 285 - 446 | 2359 |   | H0539: 1 and<br>L0777: 1.           |         |  |
| HISBM13 | 656325 | 1100 | 315 - 449 | 2360 |   | H0539: 1, L0740:<br>1 and L0599: 1. |         |  |
| HISBM08 | 959051 | 1101 | 160 - 465 | 2361 | Arg-15 to Glu-21,<br>Ser-47 to Asp-63,<br>Leu-85 to Ile-93. | L0769: 1 and<br>H0539: 1.           |         |  |
| HISBK58 | 735838 | 1102 | 586 - 750 | 2362 |   | H0539: 1 and<br>L0754: 1.           |         |  |
| HISBH79 | 774837 | 1103 | 111 - 350 | 2363 |   | H0539: 1 and<br>L0603: 1.           | 16p13.3 | 141750,<br>141800,<br>141800,<br>141800,<br>141800,<br>141850,<br>141850,<br>141850,<br>141850,<br>141850,<br>156850,<br>186580,<br>191092,<br>600140,<br>600273,<br>601313. |



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| HISBE17 | 662758 | 1104 | 42 - 251  | 2364 | Ile-23 to Leu-31.  | H0539: 1 and<br>L0740: 1.           | 601785 |
| HISBE11 | 966736 | 1105 | 86 - 223  | 2365 |  | H0539: 1 and<br>L0758: 1.           |        |
| HISAV01 | 857530 | 1106 | 5 - 211   | 2366 | Asn-4 to Glu-13.   | L0523: 1 and<br>H0539: 1.           |        |
| HISAU80 | 775438 | 1107 | 124 - 273 | 2367 |  | L0748: 4 and<br>H0539: 1.           |        |
| HISAU79 | 774728 | 1108 | 11 - 142  | 2368 | Gly-4 to Lys-10,<br>Gln-36 to Asp-41.                      | H0539: 1                            |        |
| HISAU67 | 751386 | 1109 | 1 - 156   | 2369 | His-1 to Ser-10,<br>Tyr-37 to Lys-44.                      | H0539: 1                            |        |
| HISAU07 | 952941 | 1110 | 86 - 223  | 2370 |  | H0539: 1                            |        |
| HISAT10 | 964340 | 1111 | 240 - 371 | 2371 | Asn-1 to Tyr-8.  | L0545: 1 and<br>H0539: 1.           |        |
| HISAR89 | 786749 | 1112 | 101 - 349 | 2372 | Ser-41 to Arg-47.  | L0777: 2, H0539:<br>1 and L0756: 1. |        |
| HISAQ95 | 973368 | 1113 | 2 - 184   | 2373 |  | H0539: 1                            |        |
| HISAO49 | 722310 | 1114 | 33 - 377  | 2374 | Ala-2 to Ser-35,<br>Glu-37 to Ser-42,<br>Ala-45 to Gly-59. | H0539: 1 and<br>L0361: 1.           |        |
| HISAL91 | 790044 | 1115 | 322 - 450 | 2375 |  | H0539: 1 and<br>L0744: 1.           |        |
| HISAH27 | 682899 | 1116 | 576 - 728 | 2376 |  | H0539: 1 and<br>L0754: 1.           |        |
| HISAG10 | 964526 | 1117 | 108 - 269 | 2377 | Asp-4 to Gly-20.   | L0598: 2 and<br>H0539: 1.           |        |

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| HISAF02 | 917357 | 1118 | 326 - 508 | 2378 | Lys-10 to Ile-17.   | L0768: 1 and<br>H0539: 1.                        |  |  |
| HISAE12 | 949195 | 1119 | 207 - 416 | 2379 |   | L0439: 3, L0438:<br>1 and H0539: 1.              |  |  |
| HISAD14 | 658409 | 1120 | 306 - 587 | 2380 | Ser-38 to Gln-44,<br>Gln-46 to Gly-52,<br>Thr-59 to Lys-64. | L0438: 2, H0539:<br>1, L0439: 1 and<br>L0592: 1. |  |  |
| HISAB77 | 772155 | 1121 | 63 - 224  | 2381 | Leu-26 to Leu-32,<br>Leu-42 to Tyr-47.                      | H0539: 1   |  |  |
| HISAB69 | 755024 | 1122 | 180 - 317 | 2382 | Pro-15 to Ile-20,<br>Leu-41 to Asp-46.                      | H0539: 1   |  |  |
| HISAB54 | 728915 | 1123 | 145 - 423 | 2383 | Glu-40 to Gly-45,<br>Cys-47 to Glu-53.                      | L0439: 2 and<br>H0539: 1.                        |  |  |
| HISAB52 | 727115 | 1124 | 1 - 342   | 2384 |   | H0539: 1   |  |  |
| HISAB28 | 686621 | 1125 | 2 - 112   | 2385 | Thr-25 to Arg-30.   | H0539: 1   |  |  |
| HISAB08 | 959335 | 1126 | 11 - 205  | 2386 | Cys-18 to Val-33,<br>Leu-60 to Arg-65.                      | H0539: 1   |  |  |
| HICAC35 | 707170 | 1127 | 127 - 333 | 2387 |   | L0754: 1, L0755:<br>1 and S0384: 1.              |  |  |
| HHNAC01 | 913646 | 1128 | 513 - 722 | 2388 |   | T0090: 1 and<br>L0589: 1.                        |  |  |
| HHNAB42 | 714097 | 1129 | 60 - 155  | 2389 | Thr-1 to Trp-8,<br>Pro-15 to Ser-20.                        | T0090: 1 and<br>L0745: 1.                        |  |  |
| HHLAB49 | 723222 | 1130 | 288 - 494 | 2390 | Ser-35 to Pro-41,<br>Pro-63 to Ser-69.                      | T0091: 1 and<br>L0748: 1.                        |  |  |
| HGODA23 | 675097 | 1131 | 9 - 233   | 2391 |   | H0095: 1 and<br>L0747: 1.                        |  |  |
| HGBID78 | 772814 | 1132 | 248 - 463 | 2392 | Gly-15 to Arg-21.   | H0014: 1 and                                     |  |  |

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| HGBHW16 | 662148 | 1133 | 186 - 290 | 2393 |   |  | L0605: 1.  |       |                   |  |
| HGBHV89 | 787037 | 1134 | 308 - 553 | 2394 | Cys-77 to His-82.   |  | H0014: 1 and<br>L0754: 1.                          |       |                   |  |
| HGBHO02 | 954417 | 1135 | 110 - 406 | 2395 |   |  | H0014: 1 and<br>L0740: 1.                          |       |                   |  |
| HGBHM39 | 705606 | 1136 | 244 - 483 | 2396 | Ile-4 to Lys-10.  |  | H0014: 1 and<br>L0777: 1.                          | 15q26 | 180090,<br>600318 |  |
| HGBHM18 | 854310 | 1137 | 51 - 401  | 2397 | Pro-21 to Trp-26,<br>Ser-73 to Ser-78,<br>Asp-105 to Trp-114.   |  | H0014: 1 and<br>L0752: 1.                          |       |                   |  |
| HGBHK55 | 713512 | 1138 | 282 - 515 | 2398 | Asn-49 to Asn-59.   |  | H0014: 1 and<br>L0740: 1.                          |       |                   |  |
| HGBHG78 | 942445 | 1139 | 1 - 903   | 2399 | Val-29 to Asp-35,<br>Arg-121 to Thr-131,<br>Pro-143 to Arg-148. |  | AR061: 8, AR089:<br>6<br>H0014: 1 and<br>L0752: 1. |       |                   |  |
| HGBHE82 | 780030 | 1140 | 5 - 286   | 2400 | Met-6 to Asn-18,<br>Lys-20 to Pro-34,<br>Gly-40 to Gln-57.      |  | L0439: 2, H0014:<br>1 and L0435: 1.                |       |                   |  |
| HGBHE68 | 753200 | 1141 | 225 - 437 | 2401 |   |  | L0748: 2 and<br>H0014: 1.                          |       |                   |  |
| HGBHD89 | 493910 | 1142 | 1 - 405   | 2402 | Ser-61 to Pro-70,<br>Gly-97 to Ala-103.                         |  | H0014: 1   |       |                   |  |
| HGBHD52 | 812643 | 1143 | 84 - 329  | 2403 |   |  | H0014: 1 and<br>L0748: 1.                          |       |                   |  |
| HGBHB27 | 950174 | 1144 | 694 - 951 | 2404 | Asn-1 to His-7,   |  | L0770: 2, L0471:                                   |       |                   |  |

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| HGBGZ03 | 924788 | 1145 | 28 - 252  | 2405 | Glu-14 to Ala-23,<br>Pro-55 to Pro-69,<br>Ala-79 to Gln-86. | 1, H0014: 1 and<br>L0779: 1.   |  |  |
| HGBGP21 | 671194 | 1146 | 363 - 569 | 2406 | Ala-32 to Ser-46.   | H0014: 1 and<br>L0751: 1.  |  |  |
|         |        |      |           |      | Lys-19 to Lys-25.   | L0794: 2, L0749:<br>2, H0014: 1, L0770:<br>1, L0789: 1, L0438:<br>1, L0439: 1 and<br>L0753: 1. |  |  |
| HGBGM71 | 576919 | 1147 | 116 - 373 | 2407 | Phe-14 to Met-25.   | H0014: 1 and<br>L0600: 1.  |  |  |
| HGBGL83 | 638178 | 1148 | 106 - 234 | 2408 |   | H0014: 1   |  |  |
| HGBGL35 | 707128 | 1149 | 213 - 404 | 2409 |   | H0014: 1 and<br>L0605: 1.  |  |  |
| HGBGL19 | 671668 | 1150 | 319 - 462 | 2410 |   | H0014: 1 and<br>L0748: 1.  |  |  |
| HGBFP63 | 745487 | 1151 | 1 - 300   | 2411 | Lys-20 to Val-31,<br>Phe-34 to Glu-39,<br>Thr-62 to Ala-69. | H0014: 1, L0745:<br>1 and L0750: 1.  |  |  |
| HGBEX85 | 784518 | 1152 | 125 - 238 | 2412 |   | H0014: 1 and<br>L0752: 1.  |  |  |
| HGBEX74 | 765894 | 1153 | 2 - 256   | 2413 | Pro-1 to Thr-8.   | L0748: 2, H0014:<br>1 and L0749: 1.  |  |  |
| HGBDY85 | 784615 | 1154 | 106 - 390 | 2414 | Pro-42 to Gly-48,<br>Lys-63 to Asp-69,<br>Asp-88 to Lys-93. | H0014: 1 and<br>L0766: 1.  |  |  |
| HGBDU06 | 960558 | 1155 | 1 - 501   | 2415 | Arg-12 to Phe-18.   | L0775: 3, H0014:   |  |  |

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| HGBDM36 | 707917 | 1156 | 367 - 546 | 2416 |  |  |  | L0766: 2 and<br>H0014: 1.  |  |  |
| HGBDL39 | 710349 | 1157 | 418 - 573 | 2417 |  | Ser-1 to Asp-6,<br>Pro-15 to Ser-20.                       |  | L0748: 2 and<br>H0014: 1.  |  |  |
| HGBDG15 | 660743 | 1158 | 2 - 172   | 2418 |  |  |  | H0014: 1 and<br>L0591: 1.  |  |  |
| HGBDG11 | 964929 | 1159 | 1 - 156   | 2419 |  | Asn-1 to Lys-6,<br>Asn-28 to Leu-35,<br>Ser-38 to Arg-44.  |  | H0014: 1 and<br>L0657: 1.  |  |  |
| HGBCU53 | 871948 | 1160 | 231 - 431 | 2420 |  |  |  | H0015: 1 and<br>L0594: 1.  |  |  |
| HGBCS41 | 711528 | 1161 | 180 - 317 | 2421 |  |  |  | H0015: 1 and<br>L0747: 1.  | 12q13.1<br>126337,<br>600808,<br>601284,<br>601769,<br>601769,<br>602116 |  |
| HGBBP65 | 753956 | 1162 | 91 - 333  | 2422 |  | Tyr-54 to Arg-62.  |  | H0015: 1 and<br>L0740: 1.  |  |  |
| HGBBG33 | 702930 | 1163 | 333 - 605 | 2423 |  | Phe-8 to Gln-19,<br>Arg-26 to Gly-32,<br>Gln-50 to Cys-61. |  | H0015: 1 and<br>L0747: 1.  |  |  |
| HGBBA50 | 578669 | 1164 | 227 - 364 | 2424 |  | Pro-23 to Arg-29.  |  | H0015: 1 and<br>L0748: 1.  |  |  |
| HGBAJ77 | 772756 | 1165 | 164 - 397 | 2425 |  | Leu-10 to Ser-22.  |  | H0014: 1 and   |  |  |

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| HGBAI59 | 868249 | 1166 | 345 - 569 | 2426 | Arg-38 to Pro-49.  | L0601: 1.<br>H0014: 1 and<br>L0581: 1.                     |  |  |  |
| HGBAC26 | 790172 | 1167 | 303 - 554 | 2427 |  | H0014: 1 and<br>L0748: 1.                                  |  |  |  |
| HGAMC08 | 958490 | 1168 | 2 - 349   | 2428 | Lys-13 to Tyr-23,<br>Cys-42 to Thr-52,<br>Ser-71 to Pro-82,<br>Lys-105 to Asn-112. | S0408: 1 and<br>L0764: 1.                                  |  |  |  |
| HFVKC87 | 886358 | 1169 | 544 - 771 | 2429 |  | AR051: 34,<br>AR050: 27,<br>AR054: 24<br>H0393: 1          |  |  |  |
| HFVJW07 | 951883 | 1170 | 295 - 516 | 2430 | His-12 to Pro-25,<br>Ser-45 to Gly-51,<br>Asp-58 to Trp-67.                        | L0777: 3 and<br>H0393: 1.                                  |  |  |  |
| HFVIP01 | 914567 | 1171 | 8 - 307   | 2431 | Gly-1 to Glu-16,<br>Pro-36 to Lys-45,<br>Thr-50 to Pro-56.                         | H0393: 1 and<br>L0768: 1.                                  |  |  |  |
| HFVID84 | 783129 | 1172 | 193 - 453 | 2432 | Gly-22 to Gly-30,<br>Tyr-53 to Pro-59,<br>Ile-65 to Gly-70.                        | H0393: 1 and<br>L0439: 1.                                  |  |  |  |
| HFVID08 | 959739 | 1173 | 142 - 516 | 2433 | Pro-7 to Gln-20,<br>Pro-25 to Pro-30,<br>Gly-97 to Asp-106,<br>Pro-109 to Arg-125. | L0794: 2 and<br>H0393: 1.                                  |  |  |  |
| HFVIC84 | 783131 | 1174 | 440 - 147 | 2434 | Lys-5 to Ile-16.   | L0439: 2, L0749:<br>2, H0393: 1, L0744:<br>1 and L0750: 1. |  |  |  |

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| HFVIC30 | 881306 | 1175 | 3 - 452   | 2435 | Tyr-15 to Leu-20.   | H0393: 1 and<br>L0581: 1.                                  |   |  |
| HFVHX74 | 854533 | 1176 | 173 - 409 | 2436 | Pro-1 to Val-6,<br>Pro-24 to Asn-32,<br>Ser-49 to Gln-54. | H0393: 1 and<br>L0591: 1.                                  |   |  |
| HFVHU23 | 676060 | 1177 | 375 - 512 | 2437 | Glu-18 to Ser-24.   | H0393: 1, L0779:<br>1 and L0777: 1.                        |   |  |
| HFVHR05 | 932181 | 1178 | 188 - 358 | 2438 | Thr-1 to Arg-6.   | H0393: 1, L0742:<br>1 and L0748: 1.                        |   |  |
| HFVHQ93 | 792444 | 1179 | 95 - 268  | 2439 |   | H0393: 1, L0748:<br>1 and L0596: 1.                        |   |  |
| HFVGY60 | 710929 | 1180 | 15 - 164  | 2440 |   | H0393: 1   |   |  |
|         | 854540 | 1269 | 115 - 276 | 2529 | Pro-42 to Ala-50.   |  |   |  |
| HFVGM12 | 971182 | 1181 | 221 - 328 | 2441 |   | H0393: 1 and<br>L0747: 1.                                  |   |  |
| HFVBA27 | 414543 | 1182 | 349 - 567 | 2442 |   | L0748: 6, H0152:<br>1, L0749: 1, L0779:<br>1 and L0755: 1. | 3p21-p14.<br>139330,<br>139360,<br>150250,<br>156845,<br>156845,<br>156845,<br>164500,<br>182280,<br>600163,<br>600971,<br>601226,<br>601267,<br>601373 |  |
| HFLVG70 | 757521 | 1183 | 36 - 455  | 2443 |   | H0246: 1 and   |   |  |

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| HFLUE23 | 676425 | 1184 | 90 - 248  | 2444 | Ser-15 to Gln-22.                      | L0749: 1.<br>H0199: 1 and<br>L0748: 1.           |  |
| HFLUE22 | 522779 | 1185 | 105 - 221 | 2445 | Lys-7 to Phe-13.                       | H0199: 1   |  |
| HFLUD68 | 753847 | 1186 | 102 - 305 | 2446 |  | H0199: 1 and<br>L0749: 1.                        |  |
| HFLQJ68 | 753216 | 1187 | 3 - 287   | 2447 | Lys-7 to Leu-18.                       | H0357: 1 and<br>L0745: 1.                        |  |
| HFLQJ38 | 709034 | 1188 | 94 - 357  | 2448 | Asp-17 to Asn-28,<br>Gln-83 to Gln-88. | L0748: 2 and<br>H0357: 1.                        |  |
| HEPNE51 | 855589 | 1189 | 248 - 484 | 2449 |  | S0430: 1 and<br>L0750: 1.                        |  |
| HDRMD24 | 676826 | 1190 | 57 - 257  | 2450 | Ala-19 to Ser-28.                      | S0352: 1, L0438:<br>1 and L0748: 1.              |  |
| HDRMA68 | 785478 | 1191 | 2 - 214   | 2451 | Gly-1 to Thr-11.                       | S0352: 1 and<br>L0744: 1.                        |  |
| HDRMA04 | 927372 | 1192 | 3 - 173   | 2452 |  | L0731: 3, S0352:<br>1, L0771: 1 and<br>L0605: 1. |  |
| HDDAF49 | 911314 | 1193 | 144 - 320 | 2453 | Glu-15 to Ser-24.                      | AR061: 9, AR089:<br>3<br>H0339: 1                |  |
| HDDAE06 | 954683 | 1194 | 309 - 494 | 2454 | Arg-8 to Thr-14.                       | L0748: 2 and<br>H0339: 1.                        |  |
| HDDAC56 | 733673 | 1195 | 2 - 166   | 2455 | Tyr-19 to Ile-36.                      | H0339: 1 and<br>L0754: 1.                        |  |
| HDDAC11 | 840301 | 1196 | 65 - 190  | 2456 | Ser-19 to Thr-32.                      | H0339: 1 and<br>L0754: 1.                        |  |



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| HDDAB07 | 954150 | 1197 | 165 - 260 | 2457 |   |  | H0339: 1, L0526:<br>1 and L0518: 1.   |  |  |
| HCYBO59 | 520114 | 1198 | 68 - 385  | 2458 | Glu-19 to Arg-32,<br>Glu-54 to His-78,<br>Ser-84 to Gly-95. |  | T0114: 1 and<br>L0748: 1.   |  |  |
| HCYBL79 | 888275 | 1199 | 374 - 144 | 2459 | Leu-9 to His-16.  |  | L0779: 2 and<br>T0114: 1.   |  |  |
| HCRQB03 | 922880 | 1200 | 274 - 546 | 2460 | Asp-18 to Asn-26,<br>His-28 to Gly-36,<br>Cys-67 to Gln-78. |  | S0356: 1 and<br>L0772: 1.   |  |  |
| HCRPQ40 | 881408 | 1201 | 641 - 495 | 2461 | Phe-29 to Lys-34.   |  | L0517: 2, S0356:<br>1, L0021: 1, L0527:<br>1, L0745: 1 and<br>L0758: 1.           |  |  |
| HCRPE30 | 910021 | 1202 | 49 - 123  | 2462 |   |  | S0356: 1  |  |  |
| HCROA43 | 948286 | 1203 | 1 - 810   | 2463 |   |  | AR050: 40,<br>AR054: 32,<br>AR051: 32,<br>AR061: 1, AR089:<br>1<br>S0356: 1       |  |  |
| HCRNR03 | 922819 | 1204 | 1 - 456   | 2464 |   |  | L0752: 2, S0356:<br>1, L0766: 1, L0438:<br>1 and L0439: 1.                        |  |  |
| HCRND06 | 934631 | 1205 | 2 - 235   | 2465 |   |  | S0356: 1, L0803:<br>1, L0774: 1, L0776:<br>1, L0438: 1, L0439:<br>1 and L0759: 1. |  |  |
| HCRMX10 | 963663 | 1206 | 86 - 409  | 2466 | Lys-1 to Pro-19,  |  | L0776: 3, S0356:  |  |  |

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|         |        |      |           |      |  | Phe-23 to Lys-28,<br>Gly-35 to Trp-42,<br>Ala-50 to Leu-57,<br>Ala-102 to His-107. | 1, L0805: 1 and<br>L0757: 1.                               |  |  |
| HCRMG11 | 965918 | 1207 | 12 - 284  | 2467 |  |  | S0356: 1 and<br>L0779: 1.                                  |  |  |
| HCQDE22 | 949991 | 1208 | 218 - 745 | 2468 |  | Ile-132 to Gly-138,<br>Phe-149 to Thr-154.   | AR061: 6, AR089:<br>2<br>H0596: 1 and<br>L0749: 1.         |  |  |
| HCQDA13 | 908299 | 1209 | 225 - 422 | 2469 |  | Phe-26 to Asn-33.  | L0748: 2, H0596:<br>1 and L0776: 1.                        |  |  |
| HCQCQ76 | 953491 | 1210 | 199 - 411 | 2470 |  |  | L0777: 2, H0596:<br>1, L0768: 1 and<br>L0756: 1.           |  |  |
| HCQAC71 | 951844 | 1211 | 240 - 443 | 2471 |  | Ser-16 to Cys-22,<br>Pro-35 to Cys-44.   | H0263: 1 and<br>L0759: 1.                                  |  |  |
| HCNSR78 | 773818 | 1212 | 64 - 159  | 2472 |  |  | H0231: 1 and<br>L0748: 1.                                  |  |  |
| HCNSR32 | 699694 | 1213 | 307 - 74  | 2473 |  | Glu-9 to Glu-14,<br>Thr-31 to Lys-39.  | L0754: 2 and<br>H0231: 1.                                  |  |  |
| HCNSE03 | 925492 | 1214 | 528 - 713 | 2474 |  | Arg-15 to Lys-20,<br>His-42 to Lys-53.   | L0766: 2, H0231:<br>1, L0768: 1, L0794:<br>1 and L0749: 1. |  |  |
| HCNDV73 | 764119 | 1215 | 190 - 294 | 2475 |  |  | H0597: 1 and<br>L0745: 1.                                  |  |  |
| HCNDV41 | 862324 | 1216 | 3 - 296   | 2476 |  |  | H0597: 1, L0369:<br>1 and L0666: 1.                        |  |  |

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| HCNDK37 | 706359 | 1217 | 27 - 293  | 2477 | Leu-1 to Leu-10,<br>Ser-34 to Lys-39.                       | H0597: 1 and<br>L0747: 1.   |  |  |
| HCNDF65 | 747499 | 1218 | 169 - 369 | 2478 | Glu-2 to Gln-9,<br>Arg-46 to Arg-51.                        | H0597: 1 and<br>L0748: 1.   |  |  |
| HCNDB86 | 785168 | 1219 | 187 - 519 | 2479 | Ile-4 to Pro-10.  | H0597: 1 and<br>L0748: 1.   |  |  |
| HCNCX91 | 789556 | 1220 | 46 - 189  | 2480 |   | H0597: 1 and<br>L0748: 1.   |  |  |
| HCNCX27 | 682479 | 1221 | 322 - 483 | 2481 | Asp-31 to Phe-36,<br>Thr-42 to Glu-47.                      | L0599: 2 and<br>H0597: 1.   |  |  |
| HCNCT03 | 923344 | 1222 | 334 - 429 | 2482 |   | H0597: 1 and<br>L0607: 1.   |  |  |
| HCNCO59 | 738889 | 1223 | 2 - 229   | 2483 | Lys-60 to Val-65.   | H0597: 1 and<br>L0748: 1.   |  |  |
| HCNCM79 | 892693 | 1224 | 174 - 428 | 2484 | His-25 to Leu-30,<br>Lys-52 to Ser-59,<br>Pro-73 to Ser-79. | H0597: 1 and<br>L0764: 1.   |  |  |
| HCNCF19 | 668043 | 1225 | 244 - 465 | 2485 |   | L0777: 3, L0748:<br>2, H0597: 1, L0776:<br>1, L0749: 1 and<br>L0753: 1. |  |  |
| HCNAZ20 | 670031 | 1226 | 114 - 257 | 2486 | Pro-6 to Phe-12.  | L0517: 3, H0085:<br>1 and L0748: 1.                                     |  |  |
| HCNAY45 | 716992 | 1227 | 56 - 382  | 2487 | His-27 to Arg-32.   | L0745: 2, H0085:<br>1, L0367: 1, L0748:<br>1 and L0439: 1.              |  |  |
| HCNAT92 | 518899 | 1228 | 1 - 243   | 2488 | Asn-1 to Glu-8,<br>Thr-14 to Ser-21.                        | H0085: 1  |  |  |

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|         |        |      |           |      |  |  | Gln-38 to Phe-45,<br>Gly-48 to Glu-55. |  |  |  |
| HCNAT67 | 508295 | 1229 | 155 - 274 | 2489 |  |  |  |  | H0085: 1   |  |
| HCNAQ26 | 685199 | 1230 | 408 - 548 | 2490 |  |  | Thr-7 to Glu-13.                       |  | H0085: 1 and<br>L0604: 1.                                  |  |
| HCNAP29 | 855685 | 1231 | 1 - 255   | 2491 |  |  | His-14 to Gln-19.                      |  | H0085: 1 and<br>L0766: 1.                                  |  |
| HCNAL30 | 522672 | 1232 | 3 - 83    | 2492 |  |  | Arg-10 to Gln-20.                      |  | H0085: 1   |  |
| HCNAK11 | 967945 | 1233 | 61 - 204  | 2493 |  |  | Leu-26 to Asp-32,<br>Gly-37 to Ala-48. |  | H0085: 1, L0748:<br>1, L0749: 1 and<br>L0758: 1.           |  |
| HCNAA41 | 791545 | 1234 | 183 - 572 | 2494 |  |  |  |  | H0085: 1 and<br>L0749: 1.                                  |  |
| HCLHE01 | 914341 | 1235 | 436 - 633 | 2495 |  |  |  |  | L0740: 2, H0676:<br>1, L0371: 1, L0748:<br>1 and L0608: 1. |  |
| HCIAD89 | 786766 | 1236 | 525 - 325 | 2496 |  |  |  |  | H0489: 1, L0741:<br>1 and L0756: 1.                        |  |
|         | 862441 | 1270 | 155 - 451 | 2530 |  |  | Lys-5 to Lys-15,<br>Phe-48 to Trp-61.  |  |  |  |
| HCIAC12 | 970750 | 1237 | 158 - 661 | 2497 |  |  | Gln-1 to Gln-15.                       |  | L0772: 3, H0489:<br>1 and L0764: 1.                        |  |
| HASMC23 | 675527 | 1238 | 53 - 247  | 2498 |  |  |  |  | L0756: 1 and<br>S0394: 1.                                  |  |
| HAQNH18 | 883367 | 1239 | 2 - 313   | 2499 |  |  |  |  | L0439: 3, L0438:<br>1 and S0392: 1.                        |  |
| HAQNB68 | 752573 | 1240 | 2 - 289   | 2500 |  |  | Phe-34 to Val-45.                      |  | S0392: 1 and<br>L0748: 1.                                  |  |

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| HAQMP04 | 925685 | 1241 | 338 - 742 | 2501 | Cys-47 to Asn-53.                      | L0794: 2 and<br>S0392: 1.   |  |  |
| HAQMK53 | 727708 | 1242 | 16 - 180  | 2502 |  | S0392: 1 and<br>L0748: 1.   |  |  |
| HALTA38 | 705895 | 1243 | 250 - 444 | 2503 | Asn-1 to Glu-6.                        | L0361: 2, H0147:<br>1 and L0731: 1.   |  |  |
| HALSD90 | 500844 | 1244 | 70 - 171  | 2504 |  | H0098: 1  |  |  |
| HALSD51 | 500852 | 1245 | 186 - 329 | 2505 |  | H0098: 1  |  |  |
| HALSD34 | 509765 | 1246 | 42 - 188  | 2506 |  | H0098: 1  |  |  |
| HALSD03 | 960910 | 1247 | 2 - 178   | 2507 |  | H0098: 1  |  |  |
| HALSC37 | 705894 | 1248 | 1 - 195   | 2508 |  | H0098: 1  |  |  |
| HALSC18 | 667044 | 1249 | 62 - 277  | 2509 | Ala-13 to Arg-25,<br>Asn-33 to Lys-41. | H0098: 1  |  |  |
| HAJRA03 | 923504 | 1250 | 3 - 122   | 2510 |  | L0777: 2, S0306:<br>1, L0519: 1 and<br>L0756: 1.                                  |  |  |
| H2MCA78 | 575194 | 1251 | 26 - 370  | 2511 | Gly-8 to His-17.                       | L0754: 2 and<br>T0109: 1.   |  |  |
| H2MBY07 | 953691 | 1252 | 23 - 190  | 2512 | Gln-26 to Gln-31.                      | L0751: 2, H0656:<br>1, T0109: 1, L0804:<br>1, L0806: 1, H0658:<br>1 and L0758: 1. |  |  |
| H2MBW43 | 715430 | 1253 | 114 - 287 | 2513 | Ser-11 to Glu-16.                      | T0109: 1 and<br>L0748: 1.   |  |  |
| H2MBW31 | 698281 | 1254 | 105 - 332 | 2514 | Ser-27 to His-32.                      | T0109: 1 and<br>L0748: 1.   |  |  |
| H2MBH48 | 908926 | 1255 | 103 - 411 | 2515 | His-17 to Lys-26,<br>Gln-47 to Glu-53, | AR089: 6, AR061:<br>6   |  |  |

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|         |        |      |           |      | His-78 to Ala-85.                     |  | T0109: 1 and<br>L0601: 1.                        |  |  |
| H2MBE37 | 597070 | 1256 | 349 - 597 | 2516 | Asp-1 to Asp-20,<br>Leu-44 to Asn-51. |  | T0109: 1 and<br>L0439: 1.                        |  |  |
| H2MBA41 | 711567 | 1257 | 37 - 468  | 2517 |                                       |  | T0109: 1, L0771:<br>1, L0809: 1 and<br>L0742: 1. |  |  |
| H2LAM15 | 767606 | 1258 | 3 - 584   | 2518 |                                       |  | T0115: 1, L0769:<br>1 and L0786: 1.              |  |  |
| H2CBP41 | 923006 | 1259 | 51 - 515  | 2519 | Arg-6 to Thr-12.                      |  | L0747: 2 and<br>T0110: 1.                        |  |  |

[065] The first column in Table 1A provides a unique "Clone ID NO:Z" for a cDNA clone related to each contig sequence disclosed in Table 1A. This clone ID references the cDNA clone which contains at least the 5' most sequence of the assembled contig and at least a portion of SEQ ID NO:X was determined by directly sequencing the referenced clone. The reference clone may have more sequence than described in the sequence listing or the clone may have less. In the vast majority of cases, however, the clone is believed to encode a full-length polypeptide. In the case where a clone is not full-length, a full-length cDNA can be obtained by methods known in the art and/or as described elsewhere herein.

[066] The second column in Table 1A provides a unique "Contig ID" identification for each contig sequence. The third column provides the "SEQ ID NO:X" identifier for each of the digestive system associated contig polynucleotide sequences disclosed in Table 1A. The fourth column, "ORF (From-To)", provides the location (i.e., nucleotide position numbers) within the polynucleotide sequence "SEQ ID NO:X" that delineate the preferred open reading frame (ORF) shown in the sequence listing and referenced in Table 1A, column 5, as SEQ ID NO:Y. Where the nucleotide position number "To" is lower than the nucleotide position number "From", the preferred ORF is the reverse complement of the referenced polynucleotide sequence.

[067] The fifth column in Table 1A provides the corresponding SEQ ID NO:Y for the polypeptide sequence encoded by the preferred ORF delineated in column 4. In one embodiment, the invention provides an amino acid sequence comprising, or alternatively consisting of, a polypeptide encoded by the portion of SEQ ID NO:X delineated by "ORF (From-To)". Also provided are polynucleotides encoding such amino acid sequences and the complementary strand thereto.

[068] Column 6 in Table 1A lists residues comprising epitopes contained in the polypeptides encoded by the preferred ORF (SEQ ID NO:Y), as predicted using the algorithm of Jameson and Wolf, (1988) Comp. Appl. Biosci. 4:181-186. The Jameson-Wolf antigenic analysis was performed using the computer program PROTEAN (Version 3.11 for the Power MacIntosh, DNASTAR, Inc., 1228 South Park Street Madison, WI). In specific embodiments, polypeptides of the invention comprise, or alternatively consist of, at least one, two, three, four, five or more of the predicted epitopes as described in Table 1A. It will be appreciated that depending on

the analytical criteria used to predict antigenic determinants, the exact address of the determinant may vary slightly.

[069] Column 7 in Table 1A provides an expression profile and library code: count for each of the contig sequences (SEQ ID NO:X) disclosed in Table 1A, which can routinely be combined with the information provided in Table 4 and used to determine the normal or diseased tissues, cells, and/or cell line libraries which predominantly express the polynucleotides of the invention. The first number in column 7 (preceding the colon), represents the tissue/cell source identifier code corresponding to the code and description provided in Table 4. For those identifier codes in which the first two letters are not "AR", the second number in column 7 (following the colon) represents the number of times a sequence corresponding to the reference polynucleotide sequence was identified in the tissue/cell source. Those tissue/cell source identifier codes in which the first two letters are "AR" designate information generated using DNA array technology. Utilizing this technology, cDNAs were amplified by PCR and then transferred, in duplicate, onto the array. Gene expression was assayed through hybridization of first strand cDNA probes to the DNA array. cDNA probes were generated from total RNA extracted from a variety of different tissues and cell lines. Probe synthesis was performed in the presence of  $^{33}\text{P}$  dCTP, using oligo(dT) to prime reverse transcription. After hybridization, high stringency washing conditions were employed to remove non-specific hybrids from the array. The remaining signal, emanating from each gene target, was measured using a Phosphorimager. Gene expression was reported as Phosphor Stimulating Luminescence (PSL) which reflects the level of phosphor signal generated from the probe hybridized to each of the gene targets represented on the array. A local background signal subtraction was performed before the total signal generated from each array was used to normalize gene expression between the different hybridizations. The value presented after "[array code]:" represents the mean of the duplicate values, following background subtraction and probe normalization. One of skill in the art could routinely use this information to identify normal and/or diseased tissue(s) which show a predominant expression pattern of the corresponding polynucleotide of the invention or to identify polynucleotides which show predominant and/or specific tissue and/or cell expression. The sequences disclosed herein have been determined to be predominantly expressed in digestive



system tissues, including normal and diseased digestive system tissues (See Table 1A, column 7 and Table 4).

[070] Column 8 in Table 1A provides a chromosomal map location for certain polynucleotides of the invention. Chromosomal location was determined by finding exact matches to EST and cDNA sequences contained in the NCBI (National Center for Biotechnology Information) UniGene database. Each sequence in the UniGene database is assigned to a "cluster"; all of the ESTs, cDNAs, and STSs in a cluster are believed to be derived from a single gene. Chromosomal mapping data is often available for one or more sequence(s) in a UniGene cluster; this data (if consistent) is then applied to the cluster as a whole. Thus, it is possible to infer the chromosomal location of a new polynucleotide sequence by determining its identity with a mapped UniGene cluster.

[071] A modified version of the computer program BLASTN (Altschul et al., J. Mol. Biol. 215:403-410 (1990), and Gish et al., Nat. Genet. 3:266-272 (1993)) was used to search the UniGene database for EST or cDNA sequences that contain exact or near-exact matches to a polynucleotide sequence of the invention (the 'Query'). A sequence from the UniGene database (the 'Subject') was said to be an exact match if it contained a segment of 50 nucleotides in length such that 48 of those nucleotides were in the same order as found in the Query sequence. If all of the matches that met this criteria were in the same UniGene cluster, and mapping data was available for this cluster, it is indicated in Table 1A under the heading "Cytologic Band". Where a cluster had been further localized to a distinct cytologic band, that band is disclosed; where no banding information was available, but the gene had been localized to a single chromosome, the chromosome is disclosed.

[001] Once a presumptive chromosomal location was determined for a polynucleotide of the invention, an associated disease locus was identified by comparison with a database of diseases which have been experimentally associated with genetic loci. The database used was the Morbid Map, derived from OMIM™ (*supra*). If the putative chromosomal location of a polynucleotide of the invention (Query sequence) was associated with a disease in the Morbid Map database, an OMIM reference identification number was noted in column 9, Table 1A, labeled "OMIM Disease Reference(s)". Table 5 is a key to the OMIM reference identification

numbers (column 1), and provides a description of the associated disease in Column 2.

**TABLE 1B**

| Clone ID<br>NO:Z | SEQ ID<br>NO:X | CONTIG<br>ID: | BAC ID: A | SEQ ID<br>NO:B | EXON<br>From-To  |
|------------------|----------------|---------------|-----------|----------------|--|
| H2CBG54          | 11             | 893910        | AL359207  | 2531           | 1-130<br>251-698<br>740-817<br>3930-4391<br>4529-4618<br>5450-5960<br>6657-6857<br>6961-7270<br>7461-7497<br>7543-7643<br>7880-8245<br>8742-9344<br>9648-9948<br>10669-11177<br>11678-11844<br>12187-12724 |
| H2CBG54          | 11             | 893910        | AL359207  | 2532           | 1-958  |
| H2MBV93          | 12             | 686344        | AL031847  | 2533           | 1-34<br>414-908<br>1145-1972<br>6128-6273<br>6543-6675   |
| HALSC22          | 13             | 503082        | AC013783  | 2534           | 1-325  |
| HALSC22          | 13             | 503082        | AC013783  | 2535           | 1-319  |
| HALSC22          | 13             | 503082        | AL354797  | 2536           | 1-325  |
| HALSC22          | 13             | 503082        | AC068485  | 2537           | 1-188<br>1825-2174<br>3023-3181<br>4591-4915   |
| HALSC22          | 13             | 503082        | AC013740  | 2538           | 1-325  |
| HALSC22          | 13             | 503082        | AL354797  | 2539           | 1-159  |
| HALSC22          | 13             | 503082        | AC068485  | 2540           | 1-491  |
| HALSC22          | 13             | 503082        | AL354797  | 2541           | 1-490  |
| HALSC22          | 13             | 503082        | AC068485  | 2542           | 1-230<br>285-410   |
| HALSC22          | 13             | 503082        | AC013740  | 2543           | 1-490  |
| HALSG01          | 15             | 500834        | AC025008  | 2544           | 1-68<br>166-273<br>1178-1509   |

|         |    |        |          |      |  |
|---------|----|--------|----------|------|--|
|         |    |        |          |      | 1893-2197<br>3086-3625<br>4073-4342<br>4657-4797<br>5553-5905<br>6891-6945                                 |
| HALSG01 | 15 | 500834 | AC027052 | 2545 | 1-68<br>166-273<br>1178-1509<br>1893-2197<br>3086-3625<br>4106-4342<br>4657-4797<br>5553-5905<br>6891-6945 |
| HALSG01 | 15 | 500834 | AL365187 | 2546 | 1-105<br>586-822<br>1137-1277<br>2033-2385<br>3371-3425  |
| HALSG01 | 15 | 500834 | AC025008 | 2547 | 1-335  |
| HALSG01 | 15 | 500834 | AC027052 | 2548 | 1-335  |
| HALSG01 | 15 | 500834 | AL365187 | 2549 | 1-417  |
| HALSJ15 | 17 | 501008 | AF127936 | 2550 | 1-496  |
| HALSJ15 | 17 | 501008 | AF127936 | 2551 | 1-182  |
| HALSJ15 | 17 | 501008 | AF127936 | 2552 | 1-337  |
| HALSK15 | 18 | 501003 | AL138726 | 2553 | 1-142<br>971-1066<br>2195-2893   |
| HALSL45 | 19 | 723542 | AC025712 | 2554 | 1-1822<br>1892-2371  |
| HALSN27 | 20 | 509759 | AL357077 | 2555 | 1-151<br>2431-2753   |
| HALSN27 | 20 | 509759 | AL358777 | 2556 | 1-151<br>2431-2753   |
| HCNAC10 | 25 | 968738 | AL353678 | 2557 | 1-154<br>1195-1580<br>1587-2168<br>3515-3965<br>5140-5394<br>7947-8128<br>8641-8755<br>9183-9557           |
| HCNAC10 | 25 | 968738 | AC009657 | 2558 | 1-275  |
| HCNAC10 | 25 | 968738 | AL137849 | 2559 | 1-154<br>1195-1580<br>1587-2168  |

|         |    |        |          |      |   |
|---------|----|--------|----------|------|---|
|         |    |        |          |      | 3514-3964<br>5139-5408<br>7946-8127<br>8640-8754<br>9182-9556                           |
| HCNAC10 | 25 | 968738 | AC009657 | 2560 | 1-182<br>696-774  |
| HCNAG07 | 26 | 954493 | AL359254 | 2561 | 1-332   |
| HCNAG07 | 26 | 954493 | AL359254 | 2562 | 1-399   |
| HCNAG07 | 26 | 954493 | AL359254 | 2563 | 1-153   |
| HCNAK56 | 27 | 832249 | AC023479 | 2564 | 1-256   |
| HCNAK56 | 27 | 832249 | AL136231 | 2565 | 1-256   |
| HCNAK56 | 27 | 832249 | AC023479 | 2566 | 1-258   |
| HCNAK56 | 27 | 832249 | AL136231 | 2567 | 1-258   |
| HCNAK56 | 27 | 832249 | AL136231 | 2568 | 1-644<br>709-2929<br>5175-6204<br>6371-6565<br>9803-10051<br>10520-10645<br>11191-11216 |
| HCNAL66 | 28 | 832247 | AC011747 | 2569 | 1-755   |
| HCNAL66 | 28 | 832247 | AC021669 | 2570 | 1-692   |
| HCNAL66 | 28 | 832247 | AC011747 | 2571 | 1-206<br>266-796<br>6613-6752<br>7056-7340  |
| HCNAL66 | 28 | 832247 | AC011747 | 2572 | 1-2511  |
| HCNAL66 | 28 | 832247 | AC021669 | 2573 | 1-206<br>266-796<br>6613-6752<br>7056-7340  |
| HCNAN69 | 29 | 655816 | AC068589 | 2574 | 1-318   |
| HCNAN69 | 29 | 655816 | AC009675 | 2575 | 1-318   |
| HCNAN69 | 29 | 655816 | AC009675 | 2576 | 1-520   |
| HCNAO20 | 30 | 832251 | AC073219 | 2577 | 1-123<br>288-775<br>1530-1839<br>1877-2491<br>2744-2824<br>3483-3563<br>3679-3881       |
| HCNAO20 | 30 | 832251 | AC073219 | 2578 | 1-169   |
| HCNAO20 | 30 | 832251 | AC073219 | 2579 | 1-552<br>560-881  |
| HCNAR21 | 31 | 948746 | AC073645 | 2580 | 1-421   |
| HCNAR21 | 31 | 948746 | AP002392 | 2581 | 1-421   |

|         |    |        |          |      |   |
|---------|----|--------|----------|------|---|
| HCNAR21 | 31 | 948746 | AC006595 | 2582 | 1-421   |
| HCNAR21 | 31 | 948746 | AP002392 | 2583 | 1-187   |
| HCNAR21 | 31 | 948746 | AC006595 | 2584 | 1-187   |
| HCNAR21 | 31 | 948746 | AP002392 | 2585 | 1-200   |
| HCNAR21 | 31 | 948746 | AC006595 | 2586 | 1-200   |
| HCNCH64 | 34 | 922009 | AL161457 | 2587 | 1-279   |
| HCNCH64 | 34 | 922009 | AC025021 | 2588 | 1-279   |
| HCNCH64 | 34 | 922009 | AL161457 | 2589 | 1-1531  |
| HCNCN84 | 35 | 766990 | AC074373 | 2590 | 1-270   |
| HCNCN84 | 35 | 766990 | AC024952 | 2591 | 1-270   |
| HCNCN84 | 35 | 766990 | AC025594 | 2592 | 1-269   |
| HCNCQ79 | 37 | 832242 | AC022532 | 2593 | 1-523   |
| HCNCQ79 | 37 | 832242 | AC022532 | 2594 | 1-67<br>122-447<br>610-1431<br>1433-1462  |
| HCNCU02 | 39 | 918993 | AC005971 | 2595 | 1-1487<br>6909-7046<br>9097-10457<br>10648-11165<br>12020-12240<br>12309-12707<br>12727-13046<br>13857-14385<br>17076-17407<br>17443-17739<br>20344-20631<br>25816-26241<br>26972-27033<br>27895-28012<br>28416-28841<br>30843-31004<br>31065-33416<br>33702-33996<br>34031-34209<br>34516-35103<br>36326-36709 |
| HCNCU02 | 39 | 918993 | AL356460 | 2596 | 1-1488<br>1588-1716<br>2931-3073<br>6554-6658<br>9098-10459<br>10650-11167<br>12010-12230<br>12299-12697<br>12717-13036<br>13370-13822  |

|         |    |        |          |      |  |
|---------|----|--------|----------|------|--|
|         |    |        |          |      | 13909-14224<br>14268-14695<br>17385-17715<br>17812-18047<br>20669-20769<br>23441-23581<br>26125-26550<br>27281-27342<br>28204-28321<br>28726-29150<br>31153-31314<br>31375-33728<br>34014-34308<br>34343-34521<br>34662-35415<br>36638-36933 |
| HCNCU02 | 39 | 918993 | AC005971 | 2597 | 1-89   |
| HCNCU02 | 39 | 918993 | AL356460 | 2598 | 1-383  |
| HCNCU83 | 40 | 731739 | AC004765 | 2599 | 1-515  |
| HCNCU83 | 40 | 731739 | AC004765 | 2600 | 1-440  |
| HCNCY39 | 42 | 960373 | AC004874 | 2601 | 1-291  |
| HCNCY39 | 42 | 960373 | AC004874 | 2602 | 1-329  |
| HCNDB53 | 43 | 832225 | AL139814 | 2603 | 1-350  |
| HCNDB53 | 43 | 832225 | AL139814 | 2604 | 1-207<br>220-316   |
| HCNDD83 | 44 | 832230 | AC051618 | 2605 | 1-504  |
| HCNDD83 | 44 | 832230 | AC067748 | 2606 | 1-252  |
| HCNDD83 | 44 | 832230 | AC022537 | 2607 | 1-149<br>377-515<br>640-847<br>1110-1613<br>4209-8923  |
| HCNDD83 | 44 | 832230 | AC012049 | 2608 | 1-86<br>211-418<br>681-1184<br>3786-8494   |
| HCNDD83 | 44 | 832230 | AC067748 | 2609 | 1-1003   |
| HCNDD83 | 44 | 832230 | AC051618 | 2610 | 1-208  |
| HCNDD83 | 44 | 832230 | AC022537 | 2611 | 1-338  |
| HCNDD83 | 44 | 832230 | AC012049 | 2612 | 1-338  |
| HCNDF20 | 45 | 669111 | AL365258 | 2613 | 1-264  |
| HCNDF20 | 45 | 669111 | AL138777 | 2614 | 1-264  |
| HCNDF20 | 45 | 669111 | AL365258 | 2615 | 1-317  |
| HCNDF20 | 45 | 669111 | AL138777 | 2616 | 1-243  |
| HCNDH18 | 47 | 832215 | AC007956 | 2617 | 1-283  |
| HCNDH18 | 47 | 832215 | AC007956 | 2618 | 1-374  |
| HCNDI01 | 48 | 832213 | AC068150 | 2619 | 1-902  |

|         |    |        |          |      |   |
|---------|----|--------|----------|------|---|
| HCNDI01 | 48 | 832213 | AC068150 | 2620 | 1-577   |
| HCNDK62 | 49 | 742883 | AP000482 | 2621 | 1-416   |
| HCNDK62 | 49 | 742883 | AP000744 | 2622 | 1-416   |
| HCNDK62 | 49 | 742883 | AC022045 | 2623 | 1-416   |
| HCNDL91 | 50 | 832209 | AC009125 | 2624 | 1-211   |
| HCNDL91 | 50 | 832209 | AC009125 | 2625 | 1-563   |
| HCNDQ50 | 52 | 723976 | AC019047 | 2626 | 1-386   |
| HCNDQ50 | 52 | 723976 | AC019047 | 2627 | 1-159   |
| HCNDQ50 | 52 | 723976 | AC019047 | 2628 | 1-391   |
| HCNDV42 | 53 | 927262 | AL390036 | 2629 | 1-359   |
| HCNSM15 | 54 | 914484 | AC009692 | 2630 | 1-153   |
| HCNSP37 | 55 | 655829 | AL121874 | 2631 | 1-265   |
| HCNSP37 | 55 | 655829 | AL121874 | 2632 | 1-280   |
| HCNUA84 | 58 | 522523 | AC023767 | 2633 | 1-434   |
| HCNUA84 | 58 | 522523 | AL035693 | 2634 | 1-434   |
| HCNUA84 | 58 | 522523 | AC023767 | 2635 | 1-655   |
| HCNUA84 | 58 | 522523 | AL035693 | 2636 | 1-655   |
| HCQAK31 | 59 | 915563 | Z83819   | 2637 | 1-192<br>404-572<br>914-1069<br>1585-1719<br>4259-4375<br>5635-5718<br>5808-5918<br>6260-7517 |
| HCQAK31 | 59 | 915563 | Z83819   | 2638 | 1-2095<br>3556-4688<br>5360-5468  |
| HCQCR67 | 60 | 974592 | AC027393 | 2639 | 1-721<br>871-931<br>3873-3972   |
| HCQCR67 | 60 | 974592 | AC010997 | 2640 | 1-721<br>871-931<br>3873-3972   |
| HCRMC26 | 61 | 913972 | AC019121 | 2641 | 1-888   |
| HCRMC26 | 61 | 913972 | AP002770 | 2642 | 1-729   |
| HCRMC26 | 61 | 913972 | AC019121 | 2643 | 1-609   |
| HCRMC26 | 61 | 913972 | AP002770 | 2644 | 1-609   |
| HCRMR08 | 64 | 958489 | AC024554 | 2645 | 1-106<br>215-550<br>554-974<br>1058-1205<br>1302-1434   |
| HCRMR69 | 65 | 877118 | AC005546 | 2646 | 1-84<br>94-607<br>687-742<br>971-1123   |

|         |    |        |          |      |   |
|---------|----|--------|----------|------|---|
|         |    |        |          |      | 1271-1463<br>2970-3130<br>3726-3851<br>3920-4035<br>4307-4724<br>5193-5352<br>6432-6975<br>7007-7190<br>7271-7363<br>7504-7738<br>7747-7841<br>8468-8620<br>8879-8995<br>9088-9166<br>9632-9736<br>9743-9875<br>9953-10058<br>10840-10955<br>11128-11473<br>11656-11837 |
| HCRMR69 | 65 | 877118 | AC005546 | 2647 | 1-74  |
| HCRNF63 | 68 | 916063 | AL356385 | 2648 | 1-2271  |
| HCRNF63 | 68 | 916063 | AC016501 | 2649 | 1-2271  |
| HCRNF63 | 68 | 916063 | AL356385 | 2650 | 1-468   |
| HCRNF63 | 68 | 916063 | AC016501 | 2651 | 1-480   |
| HCRNH81 | 69 | 914840 | AC024009 | 2652 | 1-604<br>2136-3385<br>3537-4031<br>5661-5910<br>6207-7370<br>8204-9136<br>9469-9651<br>9951-10249   |
| HCRNH81 | 69 | 914840 | AC040991 | 2653 | 1-604<br>2136-3385<br>3537-4031<br>5661-5910<br>6207-7371<br>8205-9137<br>9470-9652<br>9952-11650   |
| HCRNH81 | 69 | 914840 | AC009955 | 2654 | 1-604<br>2136-3385<br>3537-4031<br>5661-5910<br>6207-7370<br>8204-9136  |



|         |    |        |          |      |  |
|---------|----|--------|----------|------|--|
|         |    |        |          |      | 9469-9651<br>9951-11649  |
| HCRNH81 | 69 | 914840 | AC040991 | 2655 | 1-352  |
| HCRNH81 | 69 | 914840 | AC024009 | 2656 | 1-318<br>325-397<br>793-879<br>1049-1209<br>1481-1631<br>1903-2358<br>2458-3016  |
| HCRNH81 | 69 | 914840 | AC040991 | 2657 | 1-232<br>835-2907<br>3316-3524<br>5105-5191<br>5361-5521<br>5793-5943<br>6215-6670<br>6770-7328  |
| HCRNH81 | 69 | 914840 | AC009955 | 2658 | 1-352  |
| HCRNH81 | 69 | 914840 | AC009955 | 2659 | 1-1072<br>1285-1807<br>2969-3239<br>3322-3578<br>3718-4021<br>4166-4680<br>4899-4998<br>5290-5492<br>5600-6054<br>7661-8404<br>8578-8891<br>9249-9590<br>11693-12416<br>12628-13109<br>13182-13470<br>13675-13945<br>14072-16144<br>16553-16761<br>18342-18428<br>18598-18758<br>19030-19180<br>19452-19907<br>20007-20565 |
| HCRNI04 | 70 | 849408 | AC023257 | 2660 | 1-362  |
| HCRNI04 | 70 | 849408 | AC023257 | 2661 | 1-157  |
| HCROE42 | 72 | 950701 | AC009994 | 2662 | 1-128<br>251-354<br>1345-1494  |

|         |    |        |          |      |  |
|---------|----|--------|----------|------|--|
|         |    |        |          |      | 2052-2228<br>2346-2795   |
| HCROE42 | 72 | 950701 | AC009994 | 2663 | 1-294  |
| HCRPU05 | 78 | 931081 | AL139376 | 2664 | 1-515  |
| HCRQG35 | 80 | 954968 | AC026676 | 2665 | 1-1626<br>1827-3829<br>4165-6488<br>6710-7840<br>8251-8973<br>9301-9417                                      |
| HCRQG35 | 80 | 954968 | AC026676 | 2666 | 1-797  |
| HDRMA28 | 83 | 841936 | AC023295 | 2667 | 1-42<br>1838-1961<br>3831-4372<br>4560-4921<br>5036-5466<br>6566-6625<br>7048-7392<br>7426-8007<br>8257-8311 |
| HDRMA28 | 83 | 841936 | AC023984 | 2668 | 1-582  |
| HDRMA28 | 83 | 841936 | AC023295 | 2669 | 1-861  |
| HDRMA28 | 83 | 841936 | AC023984 | 2670 | 1-421  |
| HDRMA28 | 83 | 841936 | AC023295 | 2671 | 1-421  |
| HDRMA28 | 83 | 841936 | AC023984 | 2672 | 1-345  |
| HDRMB41 | 84 | 691662 | AC044849 | 2673 | 1-914<br>4240-4492<br>5205-5485<br>5559-5670<br>7902-8015<br>8503-8826<br>10357-10503                        |
| HDRME31 | 85 | 697523 | AL137191 | 2674 | 1-369  |
| HFLQF55 | 90 | 719018 | AC026070 | 2675 | 1-987  |
| HFLQF55 | 90 | 719018 | AL360008 | 2676 | 1-988<br>1239-1545   |
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| HFLSJ61 | 94 | 507017 | AC023047 | 2688 | 1-55<br>938-1456<br>2590-3181<br>3342-3652<br>5147-5459<br>5516-5820<br>6548-6782<br>6982-7244<br>9489-9609<br>11828-12359<br>13568-13934<br>14831-15137<br>15440-15911<br>18095-18410<br>20488-20746<br>20763-20968<br>21568-21678<br>23833-24142<br>25794-25921<br>25944-26067<br>27153-27464<br>27677-27977<br>31312-31412<br>32736-33009<br>34554-34899<br>36897-37644 |
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| HFLSK31 | 96 | 535238 | AC008770 | 2704 | 1-315  |
| HFLSK81 | 97 | 761133 | AL031584 | 2705 | 1-141<br>2019-2108<br>2220-2434<br>2527-2834<br>2922-4978  |

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| HFLUG50 | 100 | 526181 | AC026874 | 2711 | 1-341   |
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| HFLVE61 | 101 | 539872 | AC006254 | 2713 | 1-99<br>1672-1840<br>1932-2036<br>2298-2459<br>3009-3123<br>3572-4471<br>4561-4680<br>4942-5113<br>5587-5854<br>6153-6622<br>7523-7712<br>7860-7998<br>8496-8801<br>9046-9326<br>9381-9460<br>9581-9799<br>9845-9949<br>10998-11033<br>11233-11329<br>11484-11600<br>12090-12298<br>12927-13110<br>13301-13414<br>13712-14209 |
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| HFLVE85 | 102 | 531014 | AL356112 | 2715 | 1-931<br>968-1322<br>1862-2304  |
| HFLVE85 | 102 | 531014 | AL356112 | 2716 | 1-330   |
| HFLVI15 | 103 | 921860 | AC010357 | 2717 | 1-276   |
| HFVHC25 | 108 | 678573 | AC032025 | 2718 | 1-220   |
| HFVHC25 | 108 | 678573 | AC032025 | 2719 | 1-507   |
| HFVHE66 | 110 | 572852 | AC024898 | 2720 | 1-309   |
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| HFVHE66 | 110 | 572852 | AC024168 | 2722 | 1-309   |
| HFVHT75 | 114 | 573301 | AC018656 | 2723 | 1-386   |
| HFVHT75 | 114 | 573301 | AC021023 | 2724 | 1-387   |
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| HGBAH38 | 118 | 503211 | Z98946   | 2735 | 1-281   |
| HGBAH38 | 118 | 503211 | AL354652 | 2736 | 1-281   |
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| HGBAH38 | 118 | 503211 | AL354652 | 2740 | 1-306   |
| HGBAH80 | 119 | 932630 | AC067750 | 2741 | 1-230   |
| HGBAI39 | 120 | 503055 | AL157391 | 2742 | 1-375   |
| HGBAI39 | 120 | 503055 | AL157391 | 2743 | 1-615   |
| HGBAI42 | 121 | 503057 | AC074371 | 2744 | 1-431   |
| HGBAI70 | 123 | 707918 | AP002510 | 2745 | 1-321   |
| HGBAI70 | 123 | 707918 | AC023888 | 2746 | 1-321   |
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| HGBAP09 | 129 | 509265 | AC073140 | 2770 | 1-98<br>476-1037<br>1144-3678<br>3776-5355  |
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| HGBAP09 | 129 | 509265 | AC073140 | 2772 | 1-1098  |
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| HGBAQ37 | 131 | 500799 | AC064833 | 2774 | 1-727   |
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| HGBAU10 | 133 | 961242 | AC024560 | 2781 | 1-516<br>557-3437<br>3464-4398   |
| HGBAU10 | 133 | 961242 | AC024560 | 2782 | 1-375<br>931-1245  |
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| HGBAU93 | 134 | 625250 | AL139044 | 2784 | 1-54<br>237-430<br>2294-2698   |
| HGBAU93 | 134 | 625250 | AL158049 | 2785 | 1-1078   |
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| HGBAZ13 | 135 | 971646 | AL354892 | 2787 | 1-360  |
| HGBBO62 | 137 | 509691 | AC011894 | 2788 | 1-1040   |
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| HGBBO62 | 137 | 509691 | AC004938 | 2793 | 1-188  |
| HGBCH13 | 139 | 508982 | AC044825 | 2794 | 1-726  |
| HGBCH13 | 139 | 508982 | AC044825 | 2795 | 1-468  |
| HGBCH13 | 139 | 508982 | AC044825 | 2796 | 1-263  |
| HGBDB21 | 142 | 753848 | AL162497 | 2797 | 1-356  |
| HGBDB21 | 142 | 753848 | AL355810 | 2798 | 1-356  |
| HGBDB21 | 142 | 753848 | AL162497 | 2799 | 1-504  |
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| HGBDD52 | 144 | 954496 | AL049839 | 2803 | 1-56<br>1716-1913<br>2040-2700<br>3517-3806<br>5090-5760<br>5828-6634<br>6799-7486<br>9937-10357 |

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| HGBDI95 | 150 | 509439 | AL096701 | 2806 | 1-175<br>1696-1874<br>3030-3160<br>3284-3400<br>5365-5929<br>6059-6533<br>6810-6945<br>7964-8266<br>10168-10292<br>10346-10432<br>10786-11044<br>11518-12014<br>12219-12320<br>12681-13010<br>13505-14444<br>14886-15089<br>15393-17094<br>17176-18144<br>18588-18997<br>19109-19874<br>20004-20383<br>20454-20623<br>21515-21870<br>22712-22845<br>23571-24444<br>25133-25850<br>26261-27318<br>29096-29274<br>30032-30110 |
| HGBDI95 | 150 | 509439 | AL096701 | 2807 | 1-135<br>681-776  |
| HGBDI95 | 150 | 509439 | AL096701 | 2808 | 1-145   |
| HGBDL05 | 151 | 932881 | AC069137 | 2809 | 1-748   |
| HGBDL05 | 151 | 932881 | AC069137 | 2810 | 1-133   |
| HGBDL05 | 151 | 932881 | AC069137 | 2811 | 1-538   |
| HGBDL72 | 152 | 710318 | AC018738 | 2812 | 1-82<br>829-1986<br>2050-2409<br>2424-3174<br>3345-4236   |
| HGBDL72 | 152 | 710318 | AC018738 | 2813 | 1-401   |
| HGBDX24 | 154 | 678576 | AC004945 | 2814 | 1-664   |



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| HGBDX24 | 154 | 678576 | AC004945 | 2815 | 1-373  |
| HGBDY02 | 156 | 921081 | AC074191 | 2816 | 1-279  |
| HGBDY02 | 156 | 921081 | AC022240 | 2817 | 1-279  |
| HGBDY30 | 157 | 503476 | AC007298 | 2818 | 1-124<br>823-1287<br>3198-3280<br>3298-3970<br>4982-5254<br>6106-6250<br>6305-6501   |
| HGBEY32 | 159 | 971570 | AC005244 | 2819 | 1-304  |
| HGBEY32 | 159 | 971570 | AC005244 | 2820 | 1-726  |
| HGBGA29 | 160 | 508433 | AL353718 | 2821 | 1-223  |
| HGBGA29 | 160 | 508433 | AL353718 | 2822 | 1-96<br>1474-2022<br>3911-4087<br>5358-5440<br>5960-6575<br>6988-8025  |
| HGBGI57 | 162 | 573752 | AL121753 | 2823 | 1-77<br>91-640<br>2531-2639<br>3380-3625<br>3692-4433<br>4677-4862<br>5043-5355<br>5532-5893<br>6299-10579<br>12966-13230<br>14676-15242<br>15749-15996<br>16066-16393<br>16675-17238<br>17381-17885<br>18029-18260<br>19347-19477<br>20064-20199<br>20849-21010 |
| HGBGI57 | 162 | 573752 | AL356652 | 2824 | 1-77<br>91-640<br>2531-2639<br>3380-3625<br>3692-4433<br>4677-4862<br>5043-5355<br>5532-5893   |

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| HGBGI57 | 162 | 573752 | AL121753 | 2825 | 1-437  |
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| HGBGW04 | 165 | 573644 | AC006529 | 2830 | 1-641  |
| HGBHM09 | 167 | 573673 | AC023230 | 2831 | 1-209<br>335-526<br>1007-1386<br>2233-2455<br>2614-3502<br>4122-4220<br>4494-4928<br>5256-5598<br>5613-5727<br>7166-7292<br>7678-7848<br>8108-8417<br>8836-8945<br>9130-9234 |
| HGBHM09 | 167 | 573673 | AC023230 | 2832 | 1-402  |
| HGBHN46 | 168 | 573678 | AC072052 | 2833 | 1-243  |
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| HGBHS11 | 170 | 967385 | AC011143 | 2836 | 1-237  |
| HGBHS11 | 170 | 967385 | AP001593 | 2837 | 1-237  |
| HGBHS11 | 170 | 967385 | AC011143 | 2838 | 1-278  |
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| HGBHY06 | 171 | 937940 | AC027712 | 2842 | 1-643<br>2032-2152<br>2334-4231  |

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| HGBHY06 | 171 | 937940 | AL356097 | 2843 | 1-176<br>1576-1665<br>1903-2100<br>2194-2763<br>2843-3778             |
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| HGBHY06 | 171 | 937940 | AC024964 | 2846 | 1-1740  |
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| HHLBA18 | 175 | 527530 | AC019310 | 2855 | 1-302   |
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| HISAC25 | 176 | 678054 | AC019281 | 2857 | 1-480<br>538-1937<br>6767-7027<br>7811-8379<br>8543-9157<br>9301-9918 |
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| HISAM61 | 178 | 974576 | AC013439 | 2864 | 1-1302  |

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| HISAN47 | 180 | 710943 | AC015879 | 2865 | 1-117<br>312-4696   |
| HISAN47 | 180 | 710943 | AP001542 | 2866 | 1-117<br>312-4699   |
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| HISBB67 | 184 | 751467 | AL031668 | 2872 | 1-89<br>894-1281<br>3016-3432   |
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| HISBG13 | 186 | 657005 | AC046158 | 2874 | 1-433   |
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| HISBH10 | 187 | 964359 | AC025483 | 2877 | 1-424   |
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| HISBO64 | 189 | 745884 | AC073099 | 2879 | 1-501   |
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| HISBU68 | 192 | 693115 | AC011578 | 2886 | 1-382   |
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|         |     |        |          |      | 422-473<br>2238-2945<br>3165-4094<br>4288-4872<br>4973-5178<br>5228-5802<br>5844-5959<br>6059-6221<br>6337-6535<br>7090-7421 |
| HISCH85 | 195 | 761973 | AC015918 | 2890 | 1-124<br>297-1011<br>1015-1441<br>1494-2038<br>2433-2512   |
| HISCL06 | 198 | 935079 | AC026939 | 2891 | 1-444  |
| HISCL06 | 198 | 935079 | AL160167 | 2892 | 1-299  |
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| HISCN24 | 199 | 764837 | AC027447 | 2896 | 1-451<br>492-585<br>1770-2055<br>3002-3262<br>3513-3792<br>4128-4567<br>4644-4970<br>7107-7818                               |
| HISCN24 | 199 | 764837 | AC055843 | 2897 | 1-451<br>492-585<br>1770-2054  |
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| HISCP11 | 200 | 966171 | AC040933 | 2901 | 1-611  |
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| HISCP11 | 200 | 966171 | AC025531 | 2905 | 1-222  |
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| HISCV30 | 201 | 883892 | AC027630 | 2907 | 1-1944   |
| HISCV30 | 201 | 883892 | AC027630 | 2908 | 1-102  |
| HISDS91 | 204 | 787603 | AC003090 | 2909 | 1-952  |
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| HISDT82 | 205 | 790966 | AC012586 | 2914 | 1-287  |
| HISDU39 | 206 | 745914 | AC021704 | 2915 | 1-477<br>1909-2168<br>2234-2360<br>2383-2515<br>2521-2974<br>3147-3229   |
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| HISDV63 | 207 | 788753 | AC008971 | 2917 | 1-2219   |
| HISDV63 | 207 | 788753 | AC026707 | 2918 | 1-2217   |
| HISDV63 | 207 | 788753 | AC008954 | 2919 | 1-476  |
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| HISDV63 | 207 | 788753 | AC008971 | 2921 | 1-476  |
| HISDV63 | 207 | 788753 | AC026707 | 2922 | 1-476  |
| HISDV63 | 207 | 788753 | AC008954 | 2923 | 1-476  |
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| HISEA07 | 209 | 952295 | AC025699 | 2927 | 1-998  |
| HISEA07 | 209 | 952295 | AL390728 | 2928 | 1-1312   |
| HISEA07 | 209 | 952295 | AC025699 | 2929 | 1-242  |
| HISEA07 | 209 | 952295 | AL390728 | 2930 | 1-242  |
| HISEE71 | 210 | 759828 | AC068134 | 2931 | 1-432  |
| HISEE71 | 210 | 759828 | AC068134 | 2932 | 1-355  |
| HISEJ18 | 211 | 783919 | AC016568 | 2933 | 1-325  |
| HISEJ18 | 211 | 783919 | AC026696 | 2934 | 1-325  |
| HISEN88 | 213 | 760209 | AC069030 | 2935 | 1-507  |
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| HISES80 | 214 | 775598 | AC007358 | 2939 | 1-116   |
| HLDAK38 | 215 | 689904 | AC019146 | 2940 | 1-456   |
| HLDAK38 | 215 | 689904 | AC019146 | 2941 | 1-366   |
| HLDAK38 | 215 | 689904 | AC019146 | 2942 | 1-410   |
| HLDBJ86 | 217 | 882365 | AC026532 | 2943 | 1-426<br>767-796  |
| HLDBJ86 | 217 | 882365 | AC026532 | 2944 | 1-864   |
| HLDBR32 | 218 | 752494 | AL354744 | 2945 | 1-522   |
| HLDBR32 | 218 | 752494 | AL136980 | 2946 | 1-2747<br>2973-5273<br>5279-5744<br>6030-6117<br>7256-8971<br>12579-12897<br>13756-14277<br>15618-16077<br>16964-17589<br>23099-23330<br>31993-32486<br>32497-32822<br>33745-34499<br>34737-35155<br>35572-35929<br>36793-37618<br>39895-40015<br>40190-40333<br>42650-42941<br>44724-49482 |
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| HLDCG82 | 220 | 657567 | AC002553 | 2950 | 1-48<br>2951-3124<br>3171-3720<br>4049-4255<br>5803-5894<br>7434-7873<br>10312-10494<br>11290-11326<br>12700-12820<br>14083-14480<br>14492-14620<br>15488-16012<br>16093-16520<br>18310-18546<br>18797-19222  |

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| HLDOB53 | 230 | 728220 | AC005320 | 2960 | 1-329  |
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| HLDON90 | 232 | 788891 | AL118556 | 2962 | 1-114<br>146-2121  |
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| HLDON90 | 232 | 788891 | AL118556 | 2964 | 1-385  |
| HLDOR73 | 233 | 683262 | AC025902 | 2965 | 1-356  |
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| HLDOU12 | 234 | 857106 | AP001480 | 2971 | 1-109<br>224-338<br>856-2249   |
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| HLDOZ69 | 235 | 697988 | U73330   | 2976 | 1-641   |
| HLDOZ69 | 235 | 697988 | AL137143 | 2977 | 1-641   |
| HLDQB65 | 238 | 708002 | AC016439 | 2978 | 1-460   |
| HLDQB65 | 238 | 708002 | AC016439 | 2979 | 1-593   |
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| HLDQC62 | 239 | 923559 | AL359893 | 2981 | 1-544   |
| HLDQC62 | 239 | 923559 | AL359893 | 2982 | 1-387   |
| HLDRD44 | 242 | 697576 | AL138847 | 2983 | 1-542<br>1177-1283<br>3558-3678<br>4249-4748<br>4762-4862<br>4973-5546<br>6446-6717<br>7115-8799                                |
| HLDRD44 | 242 | 697576 | AL138847 | 2984 | 1-452   |
| HLDRD44 | 242 | 697576 | AL138847 | 2985 | 1-463   |
| HLDRD54 | 243 | 727954 | AC008807 | 2986 | 1-1113  |
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| HLDRD54 | 243 | 727954 | AC026439 | 2990 | 1-115   |
| HLDRD54 | 243 | 727954 | AC026439 | 2991 | 1-847   |
| HLDR194 | 246 | 784582 | AL158839 | 2992 | 1-102<br>737-824<br>1694-1817<br>2984-3042<br>6539-6691<br>6970-7470  |
| HLDR194 | 246 | 784582 | AC026545 | 2993 | 1-102<br>737-824<br>1694-1817<br>2984-3042<br>6539-6691<br>6970-7470  |
| HLDR194 | 246 | 784582 | AL354872 | 2994 | 1-573   |

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| HLDR194 | 246 | 784582 | AL158839 | 2995 | 1-185  |
| HLDR194 | 246 | 784582 | AC026545 | 2996 | 1-185  |
| HLDR194 | 246 | 784582 | AL354872 | 2997 | 1-186  |
| HLDRP14 | 247 | 657908 | AC046130 | 2998 | 1-1135   |
| HLDRP14 | 247 | 657908 | AC046130 | 2999 | 1-387  |
| HLDRQ82 | 248 | 837031 | AC012313 | 3000 | 1-726<br>806-894<br>917-1338<br>1536-1743<br>2014-2111<br>2295-2451<br>2541-2902   |
| HLDRQ82 | 248 | 837031 | AC012313 | 3001 | 1-156  |
| HLDRQ82 | 248 | 837031 | AC012313 | 3002 | 1-513  |
| HLDRR54 | 249 | 708594 | AC009128 | 3003 | 1-709  |
| HLDRR54 | 249 | 708594 | AC009128 | 3004 | 1-187  |
| HLIBI35 | 250 | 870387 | AC016127 | 3005 | 1-919<br>1498-1531   |
| HLIBI35 | 250 | 870387 | AP001164 | 3006 | 1-919<br>1498-1531   |
| HLIBI35 | 250 | 870387 | AC023989 | 3007 | 1-919<br>1498-1531   |
| HLIBI35 | 250 | 870387 | AC023989 | 3008 | 1-568  |
| HLIBI35 | 250 | 870387 | AC016127 | 3009 | 1-568  |
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| HLIBO03 | 252 | 923519 | AL139113 | 3011 | 1-291  |
| HLIBO03 | 252 | 923519 | AL139113 | 3012 | 1-447  |
| HLIBO03 | 252 | 923519 | AL139113 | 3013 | 1-106  |
| HLIBP66 | 253 | 750608 | AL157828 | 3014 | 1-227  |
| HLQAF70 | 259 | 529348 | AC023016 | 3015 | 1-288  |
| HLQAF70 | 259 | 529348 | AC073210 | 3016 | 1-351  |

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| HLQAN64 | 261 | 966910 | AC010192 | 3017 | 1-606   |
| HLQAN64 | 261 | 966910 | AC010192 | 3018 | 1-1020  |
| HLQAZ69 | 262 | 960046 | AL162261 | 3019 | 1-216<br>448-899  |
| HLQAZ69 | 262 | 960046 | AL356581 | 3020 | 1-184<br>760-868  |
| HLQAZ69 | 262 | 960046 | AL021920 | 3021 | 1-216<br>448-900  |
| HLQAZ69 | 262 | 960046 | AL137798 | 3022 | 1-216<br>448-900  |
| HLQAZ69 | 262 | 960046 | AL021920 | 3023 | 1-3164  |
| HLQAZ69 | 262 | 960046 | AL021920 | 3024 | 1-88  |
| HLQAZ69 | 262 | 960046 | AL137798 | 3025 | 1-114   |
| HLQAZ69 | 262 | 960046 | AL137798 | 3026 | 1-3163  |
| HLQBF72 | 263 | 608371 | AC061971 | 3027 | 1-203<br>1508-1629<br>1974-5541   |
| HLQBF72 | 263 | 608371 | AC004893 | 3028 | 1-41<br>1133-1241<br>1427-1553<br>2399-2737<br>4287-4420<br>4568-4632<br>6972-7047<br>7538-7844<br>7922-8246<br>8830-8975<br>9391-9633<br>10401-10479<br>10634-10832<br>11027-11398<br>11443-11735<br>12127-12683<br>12731-13740<br>13818-13849<br>13956-14155<br>15097-15212<br>16038-16136<br>16255-16667<br>19457-19556<br>19602-19720<br>21282-21463<br>22710-22809<br>23313-23452<br>24650-24771<br>25361-26716<br>28719-28801 |

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| HLQBI21 | 265 | 529342 | AL021879 | 3029 | 1-50<br>166-236<br>2094-2778   |
| HLQBX23 | 268 | 676205 | AC068301 | 3030 | 1-377  |
| HLQBX23 | 268 | 676205 | AF212832 | 3031 | 1-377  |
| HLQBX23 | 268 | 676205 | AC068301 | 3032 | 1-552  |
| HLQBX23 | 268 | 676205 | AF212832 | 3033 | 1-553  |
| HLQCY26 | 270 | 681459 | AL136451 | 3034 | 1-269  |
| HLQDB55 | 271 | 731601 | AC055781 | 3035 | 1-393  |
| HLQDB55 | 271 | 731601 | AL160004 | 3036 | 1-519<br>1061-1660<br>2822-2888<br>3573-3897<br>6610-7334<br>8328-9339<br>9440-9832<br>9973-10736  |
| HLQDB55 | 271 | 731601 | AL139252 | 3037 | 1-725<br>1718-2729<br>2830-3222<br>3363-4126   |
| HLQDB55 | 271 | 731601 | AC055781 | 3038 | 1-536  |
| HLQDB55 | 271 | 731601 | AC055781 | 3039 | 1-764  |

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| HLQDB55 | 271 | 731601 | AL160004 | 3040 | 1-1370   |
| HLQDB55 | 271 | 731601 | AL139252 | 3041 | 1-1370   |
| HLQDE61 | 273 | 741706 | AC007529 | 3042 | 1-357  |
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| HLQDP11 | 274 | 966775 | AL121601 | 3044 | 1-5979<br>7971-8283<br>8458-8763   |
| HLQDP11 | 274 | 966775 | AL121601 | 3045 | 1-469  |
| HLQDU40 | 275 | 488692 | AC068137 | 3046 | 1-561  |
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| HLQDY10 | 276 | 856755 | AC025343 | 3048 | 1-883  |
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| HLQDY10 | 276 | 856755 | AC025343 | 3050 | 1-293<br>420-741<br>1124-1247<br>3139-3175<br>3429-3476<br>4419-4789<br>5198-6060  |
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| HLQED11 | 277 | 966015 | AF006752 | 3053 | 1-310  |
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| HLQED11 | 277 | 966015 | AC005072 | 3057 | 1-278  |
| HLQED11 | 277 | 966015 | AC005072 | 3058 | 1-269  |
| HLQES58 | 279 | 856725 | AC027346 | 3059 | 1-170<br>3951-4160<br>5513-5658<br>5975-6129<br>7817-8267<br>8396-8663<br>8724-9154<br>9800-10439<br>11810-11892<br>12593-12793<br>12987-13866 |

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| HLQES58  | 279 | 856725 | AC003034 | 3060 | 1-640<br>2011-2093<br>2794-2994<br>3188-4067<br>5199-5343<br>5454-5562<br>6247-7001<br>7082-7694<br>7697-7816<br>9264-9610<br>10847-12309 |
| HLQES58  | 279 | 856725 | AC003034 | 3061 | 1-431   |
| HLQES58  | 279 | 856725 | AC027346 | 3062 | 1-347   |
| HLQES58  | 279 | 856725 | AC003034 | 3063 | 1-132<br>186-485  |
| HLQFO69  | 282 | 933385 | AL133551 | 3064 | 1-237<br>656-1001<br>1670-2919<br>2947-4187   |
| HLQ GK74 | 283 | 856736 | AC026532 | 3065 | 1-437<br>817-915<br>949-2462<br>2887-3096<br>3475-3937<br>4282-4477<br>4717-4932<br>5440-5602   |
| HLQ GK74 | 283 | 856736 | AC026532 | 3066 | 1-376   |
| HLQ GK74 | 283 | 856736 | AC026532 | 3067 | 1-864   |
| HLQGN56  | 284 | 842004 | AC008502 | 3068 | 1-891<br>1026-1322<br>1354-1403<br>1500-1594<br>5596-6127<br>6228-7815  |
| HLQGN56  | 284 | 842004 | AC069033 | 3069 | 1-55<br>996-1475<br>2335-3748<br>3786-4179<br>4211-4451<br>8452-8983<br>9092-10679  |



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| HLQGN56 | 284 | 842004 | AC069033 | 3070 | 1-466   |
| HLXTF06 | 285 | 931101 | AC024680 | 3071 | 1-102<br>502-766<br>2522-3001<br>4140-4447<br>4854-4927<br>8155-8417  |
| HNAAA40 | 286 | 574045 | AC024536 | 3072 | 1-359   |
| HNAAA40 | 286 | 574045 | AC024536 | 3073 | 1-704   |
| HNALD49 | 289 | 723168 | AC073204 | 3074 | 1-163<br>166-1011   |
| HNALD49 | 289 | 723168 | AC073204 | 3075 | 1-2016  |
| HNJB80  | 292 | 947047 | AC068591 | 3076 | 1-521   |
| HNJB80  | 292 | 947047 | AP001192 | 3077 | 1-298<br>368-888  |
| HNJB80  | 292 | 947047 | AP002800 | 3078 | 1-298<br>368-887  |
| HNJB80  | 292 | 947047 | AP001192 | 3079 | 1-243   |
| HNJB80  | 292 | 947047 | AP002800 | 3080 | 1-243   |
| HNJB80  | 292 | 947047 | AP002800 | 3081 | 1-326<br>456-710  |
| HNJBL71 | 293 | 939266 | AC013391 | 3082 | 1-185<br>2354-2457<br>3461-3728<br>3765-3920<br>4975-5430<br>6573-6838<br>6846-7660<br>9008-9223<br>9330-9467<br>9775-9902<br>10014-10231<br>11156-11573<br>11606-11840<br>14118-14273<br>14451-14627<br>14669-15015<br>15124-15682 |
| HNJBN94 | 294 | 948996 | AL121756 | 3083 | 1-76<br>857-999<br>3340-3434<br>5111-5222<br>6125-6272<br>7752-7812<br>8649-8936<br>9356-9420<br>10574-10666  |

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| HNJBN94 | 294 | 948996 | AL121756 | 3084 | 1-676  |
| HNJBW16 | 295 | 955920 | AP000593 | 3085 | 1-556  |
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| HNJEA92 | 298 | 955842 | AL121901 | 3087 | 1-46<br>1691-1869<br>2052-2212<br>2337-3256<br>3801-3909<br>4230-4383<br>5382-5472<br>6054-6117<br>6292-7307         |
| HNJEC12 | 299 | 969099 | AL355362 | 3088 | 1-1120   |
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| HNJEC12 | 299 | 969099 | AL023582 | 3091 | 1-629  |
| HNJFC68 | 300 | 956178 | AC015980 | 3092 | 1-519  |
| HNJFC68 | 300 | 956178 | AC015980 | 3093 | 1-265  |
| HNKBB44 | 301 | 955843 | AL121901 | 3094 | 1-46<br>1691-1869<br>2052-2212<br>2337-3256<br>3801-3909<br>4230-4383<br>5382-5472<br>6054-6117<br>6292-7307         |
| HNKCG51 | 306 | 933428 | AC012651 | 3095 | 1-1621   |
| HNKCG51 | 306 | 933428 | AC012651 | 3096 | 1-431  |
| HNKCG51 | 306 | 933428 | AC012651 | 3097 | 1-136  |
| HNKDV89 | 307 | 963354 | AC008401 | 3098 | 1-686  |
| HNKDV89 | 307 | 963354 | AC008905 | 3099 | 1-527<br>1329-1594<br>2331-2573<br>2841-2943<br>3635-3778<br>4769-6401<br>6442-7129                                  |
| HNKDV89 | 307 | 963354 | AC008865 | 3100 | 1-76   |

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| HPASD70 | 310 | 522675 | AC061989 | 3101 | 1-1555  |
| HPASD70 | 310 | 522675 | AF207953 | 3102 | 1-1556  |
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| HPKAA65 | 311 | 753931 | AC008733 | 3105 | 1-446   |
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| HPKAA65 | 311 | 753931 | AC008733 | 3109 | 1-194   |
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| HROAF59 | 312 | 961784 | AC026794 | 3111 | 1-717<br>1774-1938<br>2525-2620<br>2770-2963<br>3153-3288<br>3427-3619<br>4201-7297                                   |
| HROAF59 | 312 | 961784 | AC004775 | 3112 | 1-717<br>1774-1938<br>2525-2620<br>2770-2963<br>3153-3288<br>3427-3619<br>4197-8420                                   |
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| HROAL51 | 313 | 526487 | AC013655 | 3114 | 1-238   |
| HROAL51 | 313 | 526487 | AC015681 | 3115 | 1-238   |
| HROAL51 | 313 | 526487 | AC013655 | 3116 | 1-301   |
| HROAO26 | 314 | 531173 | AC021744 | 3117 | 1-133   |
| HROAO26 | 314 | 531173 | AC021744 | 3118 | 1-298   |
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| HROAV94 | 316 | 963714 | AC019136 | 3120 | 1-313   |
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| HROAV94 | 316 | 963714 | AC026073 | 3123 | 1-311   |
| HROBF58 | 318 | 735601 | AC007240 | 3124 | 1-789   |

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| HROBF58 | 318 | 735601 | AC007240 | 3125 | 1-355   |
| HROBF77 | 319 | 677615 | AL139081 | 3126 | 1-173<br>3022-3160<br>5808-5875<br>7677-7777<br>8584-8948<br>11724-11920<br>12607-12747<br>13147-13246  |
| HROBF77 | 319 | 677615 | AL161891 | 3127 | 1-173<br>3022-3160<br>5809-5876<br>7678-7778<br>8585-8949<br>11725-11921<br>12608-12748<br>13148-13247  |
| HROBM06 | 320 | 934681 | AC013400 | 3128 | 1-271   |
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| HROBQ03 | 321 | 867044 | AC018809 | 3130 | 1-380   |
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| HROBQ03 | 321 | 867044 | AC021995 | 3133 | 1-1091<br>1434-1584<br>2228-2880<br>3058-3631<br>3962-4020<br>5097-5589<br>8190-8504<br>8525-8647<br>9352-9691<br>11123-11225<br>12195-12293<br>12731-13403 |
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| HROBX40 | 323 | 835594 | AC008508 | 3143 | 1-425   |
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| HROBX40 | 323 | 835594 | AC008963 | 3145 | 1-72<br>199-622<br>1681-1783<br>1804-2149<br>2309-2737<br>3872-3952<br>4160-4506<br>4579-4617<br>5093-5192<br>5326-5415<br>6015-6373<br>6487-6591<br>7443-7584<br>9688-10260<br>11178-11224<br>11698-12149<br>12349-12551<br>14421-14645<br>17878-18012<br>18090-18469<br>18477-18563<br>18690-19256<br>20773-21084<br>21266-21315<br>21404-21475 |
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| HROCE61 | 324 | 741263 | AC008821 | 3151 | 1-424   |
| HROCE61 | 324 | 741263 | AC008924 | 3152 | 1-424   |
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| HROCE61 | 324 | 741263 | AC008821 | 3154 | 1-553  |
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| HRODC11 | 325 | 966298 | AC026347 | 3157 | 1-702  |
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| HRODC11 | 325 | 966298 | AC011859 | 3159 | 1-701  |
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| HRODH54 | 327 | 922899 | AL049610 | 3162 | 1-37<br>1329-3923  |
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| HRODH54 | 327 | 922899 | AL049610 | 3164 | 1-204  |
| HRODX50 | 331 | 722502 | AC026667 | 3165 | 1-286  |
| HRODX50 | 331 | 722502 | AC026667 | 3166 | 1-331  |
| HROEA83 | 332 | 710615 | AC011148 | 3167 | 1-389  |
| HROEA83 | 332 | 710615 | AC012125 | 3168 | 1-389  |
| HROEA83 | 332 | 710615 | AC012586 | 3169 | 1-389  |
| HROEA83 | 332 | 710615 | AC012125 | 3170 | 1-157  |
| HROEA83 | 332 | 710615 | AC012586 | 3171 | 1-154  |
| HROEB10 | 333 | 963706 | AC002540 | 3172 | 1-693<br>1113-1699<br>2841-3133<br>3307-4001   |
| HROEB10 | 333 | 963706 | AC002540 | 3173 | 1-144  |
| HSICP51 | 338 | 531307 | AC003656 | 3174 | 1-155<br>959-1409<br>2540-3125<br>3330-3932<br>6783-6896<br>7122-7956<br>8826-9101<br>10641-10955<br>11108-11476 |
| HSICP51 | 338 | 531307 | AC003656 | 3175 | 1-498  |
| HSICP51 | 338 | 531307 | AC003656 | 3176 | 1-119  |
| HSICR32 | 339 | 507173 | AP001856 | 3177 | 1-249  |
| HSICR32 | 339 | 507173 | AP001403 | 3178 | 1-258  |
| HSICR32 | 339 | 507173 | AP001856 | 3179 | 1-449<br>608-810<br>856-1900   |
| HSICR32 | 339 | 507173 | AP001403 | 3180 | 1-449<br>608-810<br>856-1900   |
| HSICU08 | 341 | 960072 | AC018384 | 3181 | 1-233  |

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| HSICU08 | 341 | 960072 | AC025073 | 3183 | 1-233  |
| HSICU08 | 341 | 960072 | AC041016 | 3184 | 1-233  |
| HSICU08 | 341 | 960072 | AC025073 | 3185 | 1-242  |
| HSICU08 | 341 | 960072 | AC041016 | 3186 | 1-457  |
| HSICU08 | 341 | 960072 | AC025073 | 3187 | 1-457  |
| HSICU08 | 341 | 960072 | AC041016 | 3188 | 1-242  |
| HSICV54 | 342 | 575344 | AF254981 | 3189 | 1-484  |
| HSICV54 | 342 | 575344 | AF267170 | 3190 | 1-484  |
| HSICV54 | 342 | 575344 | AF254981 | 3191 | 1-257  |
| HSICV54 | 342 | 575344 | AF267170 | 3192 | 1-144  |
| HSICV78 | 343 | 712629 | AC008404 | 3193 | 1-1412<br>1505-2999<br>3853-4023<br>4214-4346<br>4616-5205<br>5307-5378<br>5493-5609<br>5771-6171<br>6650-7170<br>7291-7444<br>7868-7944<br>8042-8725<br>8757-9922<br>10078-10523<br>10749-11180<br>11548-11651<br>11662-11962<br>12594-12687<br>12784-13310 |
| HSICV78 | 343 | 712629 | AC008542 | 3194 | 1-1412<br>1505-2999<br>3853-4023<br>4214-4346<br>4615-5204<br>5306-5377<br>5492-5608<br>5770-6169<br>6648-7168<br>7289-7442<br>7866-7942<br>8040-8723<br>8755-9920<br>10076-10521<br>10747-11178<br>11546-11649<br>11660-11960                               |



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| HSICV78 | 343 | 712629 | AC023788 | 3195 | 1-1412<br>1505-2998<br>3852-4022<br>4213-4345<br>4614-5203<br>5305-5376<br>5491-5607<br>5769-6169     |
| HSICV78 | 343 | 712629 | AC008542 | 3196 | 1-153<br>637-1449<br>1570-1916<br>2032-2133<br>2175-2634<br>3393-3759<br>3927-5655                    |
| HSICV78 | 343 | 712629 | AC023788 | 3197 | 1-674<br>786-1283<br>1736-2548<br>2669-3015<br>3131-3232<br>3274-3732<br>4490-4856<br>5024-6752       |
| HSICV78 | 343 | 712629 | AC008404 | 3198 | 1-102<br>144-602<br>1360-1726<br>1894-3622  |
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| HSICX21 | 344 | 531267 | AC016333 | 3200 | 1-552   |
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| HSICY35 | 345 | 713308 | AC013356 | 3204 | 1-113<br>828-929<br>2257-3186<br>3390-3700<br>4970-5485   |
| HSIDA42 | 346 | 531264 | AC011381 | 3205 | 1-202   |
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| HSIDJ20 | 350 | 526993 | AC005041 | 3211 | 1-231<br>605-1008<br>5939-6234<br>6791-6927<br>6957-7089<br>7328-7621<br>7879-9508<br>9655-10055<br>10066-10119<br>10214-10332<br>10546-10758<br>11111-11405<br>11641-11736<br>11818-13623<br>13873-14724<br>14828-15016<br>15044-15761<br>15857-16441<br>16601-16730<br>16904-17109<br>17199-17268<br>17652-17715<br>17791-18464<br>18588-18854<br>18974-19317 |
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| HSIDP49 | 353 | 531064 | AC069294 | 3216 | 1-163   |
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| HSIDT29 | 355 | 522341 | AL139414 | 3220 | 1-502   |
| HSIDT29 | 355 | 522341 | AL138752 | 3221 | 1-352<br>1007-1159<br>2419-2891<br>2936-3267<br>3511-3957<br>4152-7826<br>8666-8791<br>9044-9545<br>9582-10575<br>11106-11778<br>12036-13559<br>14332-14399<br>15052-15514<br>15565-15759<br>16840-16999<br>17551-17904<br>18143-19954<br>21322-21444 |
| HSIDT29 | 355 | 522341 | AL139414 | 3222 | 1-352<br>1007-1159<br>2419-2891<br>2936-3267<br>3511-3957<br>4152-7826<br>8669-8792   |
| HSIDT29 | 355 | 522341 | AL139414 | 3223 | 1-982   |
| HSIDT29 | 355 | 522341 | AL138752 | 3224 | 1-110   |
| HSIDT51 | 356 | 874598 | AC013356 | 3225 | 1-113<br>828-929<br>2257-3186<br>3390-3700<br>4970-5485   |
| HSIDV27 | 357 | 531246 | AL158048 | 3226 | 1-317   |
| HSIDV27 | 357 | 531246 | AL158048 | 3227 | 1-112   |
| HSIDV70 | 358 | 925083 | AC012014 | 3228 | 1-318   |
| HSIDV75 | 359 | 531265 | AC023891 | 3229 | 1-321   |
| HSIDV75 | 359 | 531265 | AC008040 | 3230 | 1-321   |
| HSIDV75 | 359 | 531265 | AC008040 | 3231 | 1-1547<br>2175-2668   |

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|         |     |        |          |      | 5555-5679   |
| HSIDV82 | 360 | 531297 | AL360176 | 3232 | 1-289<br>905-1827<br>2051-2347<br>2655-3049<br>3707-3831<br>3904-4338<br>4885-5845<br>5859-6409<br>6547-6818<br>7144-7268<br>7714-8750<br>8834-9350   |
| HSIDV82 | 360 | 531297 | AL158835 | 3233 | 1-76<br>139-503<br>1119-2041<br>2265-2561<br>2869-3263<br>3921-4045<br>4118-4552<br>5099-6059<br>6073-6623<br>6761-7033<br>7359-7483<br>7929-8965<br>9049-9565                              |
| HSIDZ20 | 363 | 920867 | AC037447 | 3234 | 1-69<br>618-942<br>1262-1305<br>2521-2623<br>2976-3238<br>3615-3665<br>3675-4220<br>4542-4670<br>4748-4848<br>5241-5520<br>5700-6159<br>6203-6837<br>6918-7872<br>8216-10348<br>10447-13273 |
| HSIDZ20 | 363 | 920867 | AC037447 | 3235 | 1-537   |
| HSIEE78 | 364 | 904664 | AL158847 | 3236 | 1-87<br>2136-2189<br>2349-2413<br>3205-3857<br>4072-4231  |

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| HSIEH84 | 366 | 531300 | AC005684 | 3237 | 1-228  |
| HSIEH84 | 366 | 531300 | AC004601 | 3238 | 1-228  |
| HSIEH84 | 366 | 531300 | AC005684 | 3239 | 1-201<br>208-351   |
| HSIEH84 | 366 | 531300 | AC004601 | 3240 | 1-201<br>208-351   |
| HSIEO62 | 368 | 531249 | AC011379 | 3241 | 1-483  |
| HSIEO62 | 368 | 531249 | AC026272 | 3242 | 1-483  |
| HSIEO62 | 368 | 531249 | AC005575 | 3243 | 1-483  |
| HSIEO62 | 368 | 531249 | AC011379 | 3244 | 1-150  |
| HSIEO62 | 368 | 531249 | AC026272 | 3245 | 1-150  |
| HSIEO62 | 368 | 531249 | AC005575 | 3246 | 1-151  |
| HSIFa06 | 369 | 866573 | AC067882 | 3247 | 1-340  |
| HSIFE28 | 374 | 686056 | AC009167 | 3248 | 1-320  |
| HSIFN66 | 377 | 742966 | AC055884 | 3249 | 1-737  |
| HSIFN66 | 377 | 742966 | AC021016 | 3250 | 1-737  |
| HSIFN66 | 377 | 742966 | AC055884 | 3251 | 1-277  |
| HSIFN66 | 377 | 742966 | AC021016 | 3252 | 1-265  |
| HSIFP22 | 378 | 674018 | AC002094 | 3253 | 1-2511   |
| HSIFP22 | 378 | 674018 | AC015917 | 3254 | 1-2514   |
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| HSIFW89 | 382 | 771820 | AP000774 | 3259 | 1-308  |
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| HSIFW89 | 382 | 771820 | AC001234 | 3261 | 1-308  |
| HSIFW94 | 383 | 765203 | AC005084 | 3262 | 1-409  |
| HSIFW94 | 383 | 765203 | AC005084 | 3263 | 1-316  |
| HSIFW94 | 383 | 765203 | AC005084 | 3264 | 1-225  |
| HSIFX92 | 384 | 968352 | AC004983 | 3265 | 1-182<br>858-1322<br>1352-3574<br>3923-4006<br>4185-4517<br>6344-6698<br>6766-7026<br>8439-8935<br>11298-11376 |

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| HSIFX92 | 384 | 968352 | AC004983 | 3266 | 1-114  |
| HSIFZ21 | 385 | 670415 | AP001878 | 3267 | 1-662<br>746-786<br>798-1019<br>2052-2249<br>4330-4490<br>4591-4690<br>5417-6545<br>6652-10646<br>10648-11231  |
| HSIFZ21 | 385 | 670415 | AL121750 | 3268 | 1-662<br>746-786<br>798-1019<br>2046-2345<br>4333-4493<br>4594-4693<br>5420-6548<br>6655-10649<br>10651-16148<br>16184-16650<br>16845-17588  |

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| HSIFZ21 | 385 | 670415 | AL121750 | 3270 | 1-1755<br>1902-2066<br>2152-2765<br>3107-3221<br>3305-3952<br>4320-4395   |
| HSIFZ21 | 385 | 670415 | AL121750 | 3271 | 1-770   |
| HSIGA28 | 388 | 686047 | AC061971 | 3272 | 1-598<br>1066-1268<br>1354-1677<br>1806-1909<br>2414-2530<br>2853-3069<br>5483-5665<br>7169-7317<br>8526-8615<br>9534-9788<br>10340-10862<br>11520-11642<br>11857-12140<br>12309-12450<br>12546-12730<br>13585-13694  |
| HSIGA28 | 388 | 686047 | AC004893 | 3273 | 1-598<br>1066-1268<br>1354-1678<br>1806-1909<br>2414-2530<br>2853-3069  |

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| HSIGA28 | 388 | 686047 | AC061971 | 3274 | 1-260  |
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| HSIGA33 | 389 | 701963 | AC012307 | 3278 | 1-412<br>472-1744  |
| HSIGA33 | 389 | 701963 | AC012307 | 3279 | 1-735  |
| HSIGD07 | 390 | 952508 | AC073230 | 3280 | 1-921  |
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| HSIGF11 | 392 | 866552 | AC012169 | 3283 | 1-420  |
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| HSIGJ45 | 396 | 718728 | AC073061 | 3285 | 1-358  |
| HSIGJ45 | 396 | 718728 | AL162260 | 3286 | 1-358  |
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| HSIGL56 | 397 | 906942 | AC023099 | 3293 | 1-361<br>482-1042  |
| HSIGL56 | 397 | 906942 | AC022264 | 3294 | 1-361<br>482-1043  |
| HSIGL56 | 397 | 906942 | AC002042 | 3295 | 1-561  |
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| HSIGL56 | 397 | 906942 | AC022264 | 3299 | 1-195  |
| HSIGL56 | 397 | 906942 | AC002042 | 3300 | 1-101  |
| HSIGL56 | 397 | 906942 | AC002042 | 3301 | 1-361  |
| HSIGL94 | 398 | 769754 | AC024952 | 3302 | 1-126<br>1960-2212<br>2845-2947<br>6326-6450<br>9966-10000   |



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|         |     |        |          |      | 12088-12311<br>13031-13145<br>13786-13869<br>14356-14874  |
| HSIGL94 | 398 | 769754 | AC018638 | 3303 | 1-123<br>666-828<br>4839-5113<br>6402-6995<br>7727-7910<br>9744-9996<br>10630-10732<br>14112-14236<br>17737-17771<br>19858-20081<br>20801-20915<br>21556-21640<br>22127-22645 |
| HSIGL94 | 398 | 769754 | AC024952 | 3304 | 1-368   |
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| HSIGM67 | 400 | 751278 | AL365436 | 3307 | 1-697<br>730-1375<br>2353-2525<br>2561-2844<br>3486-3595<br>3928-4558<br>4612-5130<br>5555-5633<br>5730-5852<br>6188-6294<br>6498-8645  |
| HSIGM67 | 400 | 751278 | AL365436 | 3308 | 1-112   |
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| HSOAT94 | 403 | 537505 | AC067894 | 3310 | 1-151   |
| HSOAT94 | 403 | 537505 | AC067894 | 3311 | 1-142   |
| HSOAW33 | 404 | 702709 | AC021937 | 3312 | 1-571   |
| HSOAW33 | 404 | 702709 | AC020988 | 3313 | 1-571   |
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| HSOBF59 | 406 | 738861 | AC022268 | 3318 | 1-350   |
| HSOBF65 | 407 | 747484 | AC011047 | 3319 | 1-395   |
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| HSOBL03 | 408 | 923317 | AC018346 | 3321 | 1-522   |
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| HSOBL03 | 408 | 923317 | AC012231 | 3323 | 1-524   |
| HSOBL59 | 410 | 738858 | AC025872 | 3324 | 1-339   |
| HSOBL59 | 410 | 738858 | AL358333 | 3325 | 1-339   |
| HSOBL59 | 410 | 738858 | AL358333 | 3326 | 1-300   |
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| HSOBQ06 | 412 | 934666 | AC022990 | 3329 | 1-410   |
| HSOBQ14 | 413 | 719796 | AC026560 | 3330 | 1-689   |
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| HSOBQ14 | 413 | 719796 | AC026560 | 3332 | 1-585   |
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| HSOBQ82 | 414 | 779093 | AC018805 | 3334 | 1-1004<br>1276-2134   |
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| HSOBQ82 | 414 | 779093 | AC022506 | 3341 | 1-154   |
| HSOBQ82 | 414 | 779093 | AC022366 | 3342 | 1-305   |
| HSODO56 | 417 | 835876 | AC019226 | 3343 | 1-829<br>1727-2190<br>3087-3561<br>4480-6255                            |
| HSODO56 | 417 | 835876 | AC023269 | 3344 | 1-1082  |
| HSODO56 | 417 | 835876 | AC009480 | 3345 | 1-144<br>1782-1897<br>4155-4983<br>5881-6344<br>7241-7715<br>8634-10409 |
| HSODO56 | 417 | 835876 | AC023269 | 3346 | 1-1537  |
| HSODO56 | 417 | 835876 | AC019226 | 3347 | 1-3959  |
| HSODO56 | 417 | 835876 | AC009480 | 3348 | 1-3959  |
| HSPAF44 | 422 | 761986 | AC024164 | 3349 | 1-538   |
| HSPAF44 | 422 | 761986 | AC027522 | 3350 | 1-538   |
| HSPAF44 | 422 | 761986 | AC024156 | 3351 | 1-538   |
| HSPAF44 | 422 | 761986 | AC027522 | 3352 | 1-116<br>445-673  |

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| HSPAF44 | 422 | 761986 | AC024164 | 3353 | 1-117  |
| HSPAF44 | 422 | 761986 | AC027522 | 3354 | 1-117  |
| HSPAF44 | 422 | 761986 | AC024156 | 3355 | 1-117  |
| HSPAK46 | 423 | 968901 | AC026283 | 3356 | 1-569  |
| HSPAK46 | 423 | 968901 | AL139287 | 3357 | 1-569  |
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| HSPAK46 | 423 | 968901 | AC026283 | 3359 | 1-593  |
| HSPAK46 | 423 | 968901 | AL139287 | 3360 | 1-582  |
| HSPAK46 | 423 | 968901 | AL139287 | 3361 | 1-96   |
| HSPAM95 | 425 | 918857 | AC068266 | 3362 | 1-112<br>908-1504<br>1558-1735<br>1885-1980<br>2239-3046   |
| HSPAP89 | 426 | 775813 | AC007881 | 3363 | 1-509<br>2929-3301<br>4056-4409<br>5680-5986<br>6164-6498<br>9223-9320<br>9344-9470<br>12102-12551<br>13283-13660<br>13880-14126<br>16151-17568<br>17955-18481<br>19088-19815<br>19859-20580<br>21056-21299                      |
| HSPAP89 | 426 | 775813 | AC007881 | 3364 | 1-882<br>1996-3153<br>5565-5935<br>8733-9076<br>10240-10309<br>10397-11192<br>11232-11332<br>11472-12080<br>12442-12874<br>13795-14210<br>14881-15281<br>15306-15477<br>15997-16155<br>16527-17205<br>18129-18562<br>19348-19732 |
| HSPAP89 | 426 | 775813 | AC007881 | 3365 | 1-358  |
| HSPAQ91 | 427 | 789887 | AC005962 | 3366 | 1-98   |

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|         |     |        |          |      | 519-633<br>778-1098<br>2517-2580<br>3003-3162<br>4409-4514<br>4862-4991<br>5381-5485<br>6160-6267<br>6815-7269<br>7747-8017<br>8092-8269<br>8521-8590<br>10043-10598<br>10666-10880<br>11074-11143<br>11247-11800<br>12028-12165<br>12353-12964<br>13077-13813 |
| HSPAQ91 | 427 | 789887 | AC005962 | 3367 | 1-429<br>727-938<br>1187-1526<br>1842-2080<br>3760-4241<br>4766-4939<br>5367-5628<br>5967-6093<br>7897-8098  |
| HSPAQ91 | 427 | 789887 | AC005962 | 3368 | 1-324  |
| HSPBL63 | 429 | 727687 | AC024676 | 3369 | 1-931  |
| HSPBL63 | 429 | 727687 | AC063956 | 3370 | 1-931  |
| HSPBL63 | 429 | 727687 | AC024676 | 3371 | 1-705  |
| HSPBL63 | 429 | 727687 | AC063956 | 3372 | 1-705  |
| HSPMG03 | 432 | 920267 | AL121901 | 3373 | 1-650  |
| HSPMG03 | 432 | 920267 | AL121901 | 3374 | 1-41<br>960-1135<br>2942-3211<br>3794-3898<br>4762-4910<br>5399-5714<br>5910-6019<br>7238-7524   |
| HSPMG03 | 432 | 920267 | AL121901 | 3375 | 1-1051   |
| HTNTD72 | 433 | 870030 | AC011597 | 3376 | 1-1118<br>1443-2331  |
| HTNTD72 | 433 | 870030 | AC067726 | 3377 | 1-1117<br>1442-2330  |

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| HTNTD72 | 433 | 870030 | AC074266 | 3378 | 1-1118<br>1443-2331  |
| HTNTD72 | 433 | 870030 | AC011597 | 3379 | 1-171  |
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| HTNTD72 | 433 | 870030 | AC074266 | 3381 | 1-171  |
| HTPAA30 | 434 | 509812 | AC017049 | 3382 | 1-991  |
| HTPAF01 | 436 | 961063 | AC012459 | 3383 | 1-260<br>312-649<br>2772-2876<br>5529-5943<br>7832-8309<br>8510-9187<br>9737-10390<br>10493-11394  |
| HTPAF01 | 436 | 961063 | AC012459 | 3384 | 1-673  |
| HTPAF01 | 436 | 961063 | AC012459 | 3385 | 1-157  |
| HTPAG78 | 437 | 773936 | AL138689 | 3386 | 1-393  |
| HTPAG78 | 437 | 773936 | AL138689 | 3387 | 1-366  |
| HTPBH46 | 438 | 522888 | AC055798 | 3388 | 1-312  |
| HTPBH46 | 438 | 522888 | AC055798 | 3389 | 1-105  |
| HTPBQ47 | 439 | 922777 | AC020913 | 3390 | 1-425<br>665-988<br>1074-1240<br>2370-2873<br>3013-3777<br>3799-4748   |
| HTPBQ47 | 439 | 922777 | AC008536 | 3391 | 1-425<br>681-988<br>1086-1239  |
| HTPBQ47 | 439 | 922777 | AC010646 | 3392 | 1-425<br>665-988<br>1074-1240<br>1630-1763<br>2370-2873<br>3013-3759<br>3800-4750<br>5484-5900<br>6149-6404<br>7522-7653<br>7678-7822<br>9244-9344<br>9545-9845<br>10064-10093 |
| HTPBQ47 | 439 | 922777 | AC020913 | 3393 | 1-290  |
| HTPBQ47 | 439 | 922777 | AC008536 | 3394 | 1-290  |
| HTPBQ47 | 439 | 922777 | AC010646 | 3395 | 1-147<br>327-996   |

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| HTPBQ47 | 439 | 922777 | AC010646 | 3396 | 1-290  |
| HTPBT55 | 440 | 509264 | AC016884 | 3397 | 1-302  |
| HTPBT55 | 440 | 509264 | AC016884 | 3398 | 1-412  |
| HTPCK55 | 442 | 732458 | AC034166 | 3399 | 1-585<br>2653-2748<br>3689-3806  |
| HTPCN85 | 443 | 529760 | AC040988 | 3400 | 1-208  |
| HTPCO32 | 444 | 973306 | AC027220 | 3401 | 1-921<br>1534-2411<br>2577-2645  |
| HTPCO32 | 444 | 973306 | AC027220 | 3402 | 1-812  |
| HTPCR51 | 445 | 526406 | AC023393 | 3403 | 1-263  |
| HTPCR51 | 445 | 526406 | AC073879 | 3404 | 1-263  |
| HTPCR51 | 445 | 526406 | AC061964 | 3405 | 1-263  |
| HTPCR51 | 445 | 526406 | AC061964 | 3406 | 1-326  |
| HTPCR51 | 445 | 526406 | AC023393 | 3407 | 1-326  |
| HTPCR51 | 445 | 526406 | AC073879 | 3408 | 1-326  |
| HTPCT55 | 447 | 592481 | AC005844 | 3409 | 1-350  |
| HTPCT55 | 447 | 592481 | AC005844 | 3410 | 1-394  |
| HTPCT67 | 448 | 573704 | AC006356 | 3411 | 1-901<br>1673-2079<br>2167-2604<br>4189-4338   |
| HTPCT67 | 448 | 573704 | AC006356 | 3412 | 1-328  |
| HTPDI16 | 454 | 830553 | AL353658 | 3413 | 1-458  |
| HTPDI16 | 454 | 830553 | AL121829 | 3414 | 1-458  |
| HTPDI16 | 454 | 830553 | AL353658 | 3415 | 1-443  |
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| HTPDI16 | 454 | 830553 | AL121829 | 3417 | 1-562<br>615-952<br>1263-1442  |
| HTPDI16 | 454 | 830553 | AL121829 | 3418 | 1-443  |
| HTPDJ94 | 456 | 669158 | AC022315 | 3419 | 1-1410<br>1518-1725<br>1802-1936<br>2078-2124<br>2214-2264<br>2402-3032<br>3817-4733 |
| HTPDJ94 | 456 | 669158 | AC022315 | 3420 | 1-812<br>993-1109<br>1527-1686   |

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| HTPDJ94 | 456 | 669158 | AC022315 | 3421 | 1-293  |
| HTPDK32 | 457 | 699457 | AC008749 | 3422 | 1-408  |
| HTPDK32 | 457 | 699457 | AC008969 | 3423 | 1-528<br>560-910<br>1002-1409  |
| HTPDK32 | 457 | 699457 | AC008749 | 3424 | 1-112  |
| HTPDK32 | 457 | 699457 | AC008969 | 3425 | 1-232  |
| HTPDK32 | 457 | 699457 | AC008969 | 3426 | 1-331  |
| HTPDZ94 | 465 | 660751 | AC007877 | 3427 | 1-346  |
| HTPEH20 | 466 | 573667 | AL117356 | 3428 | 1-605  |
| HTPFA05 | 467 | 869865 | AP001855 | 3429 | 1-358  |
| HTPFA05 | 467 | 869865 | AP000752 | 3430 | 1-110<br>512-869<br>1135-1247<br>1774-1913<br>2885-5355  |
| HTPFA05 | 467 | 869865 | AP001855 | 3431 | 1-197<br>875-1000<br>2561-2645   |
| HTPFA05 | 467 | 869865 | AP000752 | 3432 | 1-42<br>1271-1678<br>1771-2261<br>2640-2835<br>3473-3551<br>3866-4278<br>5403-5601<br>6277-6402<br>7963-8047 |
| HTPFD02 | 468 | 974295 | AL157697 | 3433 | 1-957  |
| HTPFD02 | 468 | 974295 | AL035588 | 3434 | 1-957<br>2286-2655<br>4218-4445<br>6333-6831<br>7919-8846  |
| HTPFI35 | 469 | 874323 | AL161895 | 3435 | 1-888<br>3955-4169<br>4848-5257  |
| HTPFI35 | 469 | 874323 | AL359741 | 3436 | 1-888<br>3952-4166<br>4844-5253  |
| HTPFI35 | 469 | 874323 | AL161895 | 3437 | 1-242<br>284-427   |
| HTPFI35 | 469 | 874323 | AL359741 | 3438 | 1-243<br>285-428   |
| HTPFJ95 | 470 | 933120 | AC015748 | 3439 | 1-466  |
| HTPFJ95 | 470 | 933120 | AC015748 | 3440 | 1-460  |

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| HTPFM04 | 472 | 926728 | AC005013 | 3441 | 1-524   |
| HTPFM04 | 472 | 926728 | AC034183 | 3442 | 1-513   |
| HTPFM04 | 472 | 926728 | AC005013 | 3443 | 1-1093  |
| HTPFM04 | 472 | 926728 | AC034183 | 3444 | 1-1093  |
| HTPFM04 | 472 | 926728 | AC034183 | 3445 | 1-459   |
| HTPFN90 | 473 | 926462 | AC005035 | 3446 | 1-271<br>2873-3271  |
| HTPFN90 | 473 | 926462 | AC005035 | 3447 | 1-806   |
| HTPFN90 | 473 | 926462 | AC005035 | 3448 | 1-678<br>2760-3043<br>4681-4771<br>5491-5924<br>6028-6450<br>6898-7029<br>7367-7901<br>8341-8822<br>9587-9641<br>11078-11155<br>14996-15172<br>17787-17857<br>18911-20377 |
| HTPFS01 | 475 | 914908 | AL357792 | 3449 | 1-393   |
| HTPFS01 | 475 | 914908 | AC012043 | 3450 | 1-393   |
| HTPFW04 | 476 | 926537 | AC010687 | 3451 | 1-843<br>1001-1432<br>1741-1836<br>1867-2400<br>2427-3216   |
| HTPFW04 | 476 | 926537 | AC005214 | 3452 | 1-861<br>1019-1450<br>1759-1854<br>1885-2418<br>2445-3235   |
| HTPFW04 | 476 | 926537 | AC005214 | 3453 | 1-559<br>1031-1412<br>1564-1910   |
| HTPFX77 | 477 | 961059 | AC008490 | 3454 | 1-432   |
| HTPFX77 | 477 | 961059 | AC011794 | 3455 | 1-432   |
| HTPFX77 | 477 | 961059 | AC008513 | 3456 | 1-432   |
| HTPFY31 | 478 | 869839 | AC068553 | 3457 | 1-800<br>878-1138<br>1157-1593<br>1952-2685<br>2735-3755<br>3832-4539   |
| HTPFY31 | 478 | 869839 | AC068553 | 3458 | 1-455   |
| HTPFY73 | 480 | 906905 | AL078593 | 3459 | 1-602   |



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| HTPFY73 | 480 | 906905 | AL078593 | 3460 | 1-340  |
| HTPFZ03 | 481 | 922755 | AL352978 | 3461 | 1-901<br>1228-1472<br>1727-1866<br>2284-2685<br>2764-3226<br>3570-5034   |
| HTPFZ03 | 481 | 922755 | AL359402 | 3462 | 1-901<br>1228-1472<br>1727-1866<br>2285-2686<br>2765-3227<br>3571-5036   |
| HTPFZ03 | 481 | 922755 | AL352978 | 3463 | 1-310  |
| HTPFZ03 | 481 | 922755 | AL352978 | 3464 | 1-317  |
| HTPFZ03 | 481 | 922755 | AL359402 | 3465 | 1-310  |
| HTPFZ03 | 481 | 922755 | AL359402 | 3466 | 1-310  |
| HTPGD19 | 482 | 869842 | AL031730 | 3467 | 1-40<br>256-553<br>604-749<br>1554-1672<br>3191-3890<br>4988-5469<br>5963-6428<br>7245-7377<br>7519-8047<br>8059-8730<br>9746-9831 |
| HTPGD19 | 482 | 869842 | AL031730 | 3468 | 1-99   |
| HTPGF79 | 484 | 974301 | AC024388 | 3469 | 1-532  |
| HTPGF79 | 484 | 974301 | AC027164 | 3470 | 1-532  |
| HTPGF79 | 484 | 974301 | AC027164 | 3471 | 1-655  |
| HTPGF79 | 484 | 974301 | AC024388 | 3472 | 1-655  |
| HTPGF79 | 484 | 974301 | AC027164 | 3473 | 1-556  |
| HTPGK10 | 486 | 963169 | AC011382 | 3474 | 1-485  |
| HTPGK10 | 486 | 963169 | AC010294 | 3475 | 1-485  |
| HTPGK10 | 486 | 963169 | AC011382 | 3476 | 1-258  |
| HTPGK10 | 486 | 963169 | AC011382 | 3477 | 1-391  |
| HTPGL49 | 487 | 974015 | AC011786 | 3478 | 1-566  |
| HTPGL49 | 487 | 974015 | AC011786 | 3479 | 1-606  |
| HTPGR61 | 488 | 869802 | AC010810 | 3480 | 1-525  |
| HTPGR61 | 488 | 869802 | AC016252 | 3481 | 1-145<br>930-1048<br>2207-2696<br>2840-2976<br>6121-6228<br>6882-9973  |

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| HTPGR61 | 488 | 869802 | AC016252 | 3482 | 1-308   |
| HTPGR61 | 488 | 869802 | AC016252 | 3483 | 1-479   |
| HTPGW12 | 489 | 969522 | AC011571 | 3484 | 1-709<br>738-1845   |
| HTPGW12 | 489 | 969522 | AL358933 | 3485 | 1-738<br>767-1874   |
| HTPGW12 | 489 | 969522 | AL121944 | 3486 | 1-738<br>767-1874   |
| HTPGW12 | 489 | 969522 | AC011571 | 3487 | 1-400   |
| HTPGW12 | 489 | 969522 | AL358933 | 3488 | 1-400   |
| HTPGW12 | 489 | 969522 | AL121944 | 3489 | 1-444   |
| HTPGW12 | 489 | 969522 | AL121944 | 3490 | 1-400   |
| HTPHD53 | 490 | 869795 | AL355800 | 3491 | 1-1225<br>1430-1457<br>1862-3511<br>4786-4989<br>6159-6314<br>6362-6929<br>8581-9079<br>9809-10085<br>10334-10512<br>12541-13078<br>13149-13260<br>14212-14291<br>14375-14484 |
| HTPHD53 | 490 | 869795 | AC055803 | 3492 | 1-568<br>2220-2374<br>3448-3724<br>3973-4151<br>6181-6718<br>6789-6900<br>7849-7931<br>8015-8124<br>10089-10201<br>10412-10809<br>11215-11626<br>12263-12288                  |
| HTPHD53 | 490 | 869795 | AL137802 | 3493 | 1-1225<br>1441-1468<br>1873-3522<br>4797-5000<br>6170-6325<br>6373-6940<br>8592-9090<br>9820-10096<br>10345-10523<br>12552-13089  |

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|         |     |        |          |      | 13160-13271<br>14223-14302<br>14386-14495  |
| HTPHD53 | 490 | 869795 | AC055803 | 3494 | 1-105  |
| HTPHD53 | 490 | 869795 | AL355800 | 3495 | 1-349  |
| HTPHD53 | 490 | 869795 | AC055803 | 3496 | 1-156  |
| HTPHD53 | 490 | 869795 | AL137802 | 3497 | 1-117  |
| HTPHD53 | 490 | 869795 | AL137802 | 3498 | 1-349  |
| HTPHE36 | 491 | 869814 | AC008955 | 3499 | 1-600  |
| HTPHE36 | 491 | 869814 | AC008963 | 3500 | 1-599  |
| HTPHE36 | 491 | 869814 | AC008452 | 3501 | 1-600  |
| HTPHE36 | 491 | 869814 | AC008906 | 3502 | 1-600  |
| HTPHE36 | 491 | 869814 | AC008955 | 3503 | 1-367  |
| HTPHE36 | 491 | 869814 | AC008452 | 3504 | 1-367  |
| HTPHE36 | 491 | 869814 | AC008906 | 3505 | 1-367  |
| HTPHG90 | 492 | 914955 | AC005189 | 3506 | 1-524  |
| HTPHG90 | 492 | 914955 | AC005189 | 3507 | 1-179  |
| HTPHI08 | 493 | 958077 | AL008734 | 3508 | 1-38<br>168-673<br>2071-2197   |
| HTPHI08 | 493 | 958077 | AL008734 | 3509 | 1-262  |
| HTPHT28 | 497 | 952088 | AC076966 | 3510 | 1-4074   |
| HTPHT28 | 497 | 952088 | AC067992 | 3511 | 1-4074   |
| HTPHT28 | 497 | 952088 | AC076966 | 3512 | 1-1391   |
| HTPHT28 | 497 | 952088 | AC067992 | 3513 | 1-2550<br>4032-4465<br>4485-4833<br>4835-5125<br>5219-6157<br>6709-6801<br>6950-7045   |
| HTPHV17 | 498 | 926455 | AL359095 | 3514 | 1-487  |
| HTPHV17 | 498 | 926455 | AL133283 | 3515 | 1-487  |
| HTPIE48 | 500 | 911422 | AC005954 | 3516 | 1-118<br>1208-1596<br>5809-5862<br>8096-8208<br>8442-8680<br>10094-10308<br>10499-10599<br>10960-11170<br>11298-11645<br>12507-12838<br>13149-13818<br>13929-14078<br>15553-15626<br>16027-16241 |

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|         |     |        |          |      | 16318-16421<br>17336-17629<br>17807-18015<br>18421-19058<br>19159-19221<br>19233-19928<br>20115-20644<br>20731-21386<br>22053-22267<br>22362-22535<br>22645-22988<br>23309-23476<br>23569-23649<br>23739-23886<br>24169-24295<br>25772-25881<br>25999-26204<br>27159-27504<br>27519-27621<br>28747-29313<br>29474-29846<br>30160-30276<br>31078-31168 |
| HTPIE48 | 500 | 911422 | AC068475 | 3517 | 1-54<br>2300-2412<br>2646-2884<br>3718-3872<br>4302-4512  |
| HTPIE48 | 500 | 911422 | AC005954 | 3518 | 1-131   |
| HUFAG81 | 503 | 966223 | AC013693 | 3519 | 1-658   |
| HUFAG81 | 503 | 966223 | AC013693 | 3520 | 1-93  |
| HUFAG81 | 503 | 966223 | AC013693 | 3521 | 1-518   |
| HUFAJ29 | 504 | 690591 | AL136332 | 3522 | 1-1696<br>2600-2765<br>3216-3674<br>4067-4546<br>4588-5787<br>12134-12602<br>12771-13071<br>13789-13952<br>15588-15963<br>16903-17402<br>17530-17844<br>17931-18201<br>18498-18878<br>19678-20070<br>20454-20851  |

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|         |     |        |          |      | 24893-26005<br>33459-33566<br>33686-34028<br>34941-35939<br>36342-37413             |
| HUFAJ29 | 504 | 690591 | AL136332 | 3523 | 1-354   |
| HUFAN64 | 506 | 678677 | AC025902 | 3524 | 1-199<br>285-484  |
| HUFAN64 | 506 | 678677 | AP002027 | 3525 | 1-397   |
| HUFAN64 | 506 | 678677 | AC025902 | 3526 | 1-356   |
| HUFAN64 | 506 | 678677 | AP002027 | 3527 | 1-356   |
| HUFAN64 | 506 | 678677 | AP002027 | 3528 | 1-281<br>336-410  |
| HUFAP02 | 507 | 919805 | AC020635 | 3529 | 1-242<br>280-748<br>998-1679  |
| HUFAP02 | 507 | 919805 | AC020635 | 3530 | 1-502   |
| HUFAU25 | 508 | 678024 | AC009721 | 3531 | 1-127<br>1975-2071<br>4531-4643<br>7288-7465<br>11300-12042<br>12627-13407          |
| HUFAU25 | 508 | 678024 | AC009721 | 3532 | 1-313   |
| HUFBN27 | 510 | 868997 | AC012358 | 3533 | 1-67<br>2583-2817<br>4030-4136  |
| HUFBU14 | 511 | 868993 | AP000436 | 3534 | 1-475<br>695-2019   |
| HUFBU14 | 511 | 868993 | AC055871 | 3535 | 1-474   |
| HUFBU14 | 511 | 868993 | AP000814 | 3536 | 1-474   |
| HUFBU14 | 511 | 868993 | AP000436 | 3537 | 1-290   |
| HUFBU14 | 511 | 868993 | AC055871 | 3538 | 1-290   |
| HUFBU14 | 511 | 868993 | AP000814 | 3539 | 1-150   |
| HUFBU14 | 511 | 868993 | AC055871 | 3540 | 1-460   |
| HUFBU61 | 513 | 741770 | AC007422 | 3541 | 1-462   |
| HUFGH78 | 516 | 659722 | AL035413 | 3542 | 1-260<br>2383-2573<br>2759-2870<br>3628-3740<br>3968-4070<br>4631-4763<br>5859-6408 |
| HUFGH78 | 516 | 659722 | AL035413 | 3543 | 1-726   |
| HUFGH78 | 516 | 659722 | AL035413 | 3544 | 1-701   |
| HVAET61 | 522 | 965365 | AC009524 | 3545 | 1-151   |
| HVAET61 | 522 | 965365 | AC025036 | 3546 | 1-148   |

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| HVAET61 | 522 | 965365 | AC027300 | 3547 | 1-158  |
| HVAET61 | 522 | 965365 | AC022232 | 3548 | 1-152  |
| HVAET61 | 522 | 965365 | AC016327 | 3549 | 1-165  |
| HVAET61 | 522 | 965365 | AC048342 | 3550 | 1-130  |
| HVAET61 | 522 | 965365 | AC016327 | 3551 | 1-195  |
| HVAET61 | 522 | 965365 | AC048342 | 3552 | 1-118  |
| HVAFD06 | 523 | 933527 | AL118505 | 3553 | 1-1166   |
| HVAHA06 | 524 | 933531 | AC011290 | 3554 | 1-145<br>552-865<br>1223-1358<br>3157-3930<br>3934-4305<br>4523-6836   |
| HVAHA06 | 524 | 933531 | AC011290 | 3555 | 1-393  |
| HVARE86 | 532 | 965243 | AL022395 | 3556 | 1-466<br>3482-3822<br>4489-4835<br>9658-10006<br>10629-10809<br>14666-15246<br>17973-18073<br>20754-20826<br>25652-25966<br>26380-27922<br>28216-28487<br>28737-29333<br>29428-29743<br>30589-31023<br>31154-32844 |
| HVARE86 | 532 | 965243 | AL022395 | 3557 | 1-1835<br>5537-6175  |
| HWCAG91 | 533 | 773364 | AC023424 | 3558 | 1-620  |
| HWCAG91 | 533 | 773364 | AC023424 | 3559 | 1-238  |
| HWGAC19 | 534 | 668126 | AL161932 | 3560 | 1-110<br>122-544<br>867-1160<br>1851-2235<br>2612-2756   |
| HWGAC19 | 534 | 668126 | AL365319 | 3561 | 1-110<br>122-544<br>867-1160<br>1851-2235<br>2442-2877   |
| HWGAC19 | 534 | 668126 | AC006101 | 3562 | 1-498<br>4048-4510<br>4591-5035<br>7998-8366   |

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|         |     |        |          |      | 9505-9834<br>16994-17102<br>18224-18262<br>18303-18402<br>18817-18901<br>19042-19175<br>19751-20041<br>20217-20545<br>20759-20905<br>21131-21753<br>22387-22582<br>23650-23720<br>24438-24706<br>24874-24994<br>25509-25720<br>25728-26150<br>26474-26767<br>27458-27842<br>28218-28363<br>28943-29281<br>29903-30245<br>32125-32153<br>32337-32651<br>33747-33938<br>34389-34693<br>34722-35083<br>35498-35561<br>35654-35765<br>36828-36930<br>37738-38163<br>38224-38289<br>38401-38474<br>38613-38736<br>39429-39649<br>41127-41283<br>41443-41873<br>42310-42618<br>43167-43617<br>43659-43881<br>44600-45100<br>45253-47944 |
| HWGAC19 | 534 | 668126 | AL161932 | 3563 | 1-340   |
| HWGAC19 | 534 | 668126 | AL365319 | 3564 | 1-102   |
| HWGAC19 | 534 | 668126 | AL161932 | 3565 | 1-102   |
| HWGAC19 | 534 | 668126 | AC006101 | 3566 | 1-193   |
| HWGQD52 | 537 | 726390 | AC074091 | 3567 | 1-1376<br>1666-2055   |

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|         |     |        |          |      | 4634-4964<br>6341-6941<br>8545-9292<br>9420-10409<br>10574-12244 |
| HWLAL74 | 539 | 761974 | AL161795 | 3568 | 1-313  |
| HWLAL74 | 539 | 761974 | AC010986 | 3569 | 1-313  |
| HWLAL74 | 539 | 761974 | AL161795 | 3570 | 1-148  |
| HWLAL74 | 539 | 761974 | AC010986 | 3571 | 1-148  |
| HWLCV54 | 544 | 929742 | AL136418 | 3572 | 1-238<br>312-613<br>1183-2359                                    |
| HWLCV54 | 544 | 929742 | AL139054 | 3573 | 1-238<br>312-613<br>1183-2359                                    |
| HWLCV54 | 544 | 929742 | AL136418 | 3574 | 1-686  |
| HWLCV54 | 544 | 929742 | AL139054 | 3575 | 1-686  |
| HWLDO22 | 545 | 838721 | AC061989 | 3576 | 1-1555   |
| HWLDO22 | 545 | 838721 | AF207953 | 3577 | 1-1556   |
| HWLDO22 | 545 | 838721 | AC061989 | 3578 | 1-272  |
| HWLDO22 | 545 | 838721 | AF207953 | 3579 | 1-272  |
| HWLED58 | 546 | 830330 | AC022097 | 3580 | 1-500  |
| HWLED58 | 546 | 830330 | AC009229 | 3581 | 1-500  |
| HWLEF86 | 547 | 785193 | AL355336 | 3582 | 1-158  |
| HWLEF86 | 547 | 785193 | AC027364 | 3583 | 1-158  |
| HWLEF86 | 547 | 785193 | AL355336 | 3584 | 1-308  |
| HWLEF86 | 547 | 785193 | AC027364 | 3585 | 1-308  |
| HWLEF86 | 547 | 785193 | AL355336 | 3586 | 1-573  |
| HWLEF86 | 547 | 785193 | AC027364 | 3587 | 1-559  |
| HWLEH06 | 548 | 934649 | AC022468 | 3588 | 1-549  |
| HWLEK39 | 552 | 918545 | AC026041 | 3589 | 1-602  |
| HWLEK39 | 552 | 918545 | AC025342 | 3590 | 1-594  |
| HWLEK39 | 552 | 918545 | AL358177 | 3591 | 1-594  |
| HWLEK39 | 552 | 918545 | AC025342 | 3592 | 1-247<br>526-1300  |
| HWLEK39 | 552 | 918545 | AL358177 | 3593 | 1-247<br>526-1300  |
| HWLEK39 | 552 | 918545 | AC026041 | 3594 | 1-247<br>526-1300  |
| HWLEN20 | 554 | 963418 | AL355388 | 3595 | 1-634  |
| HWLEN20 | 554 | 963418 | AL356734 | 3596 | 1-634  |
| HWLEN20 | 554 | 963418 | AL355388 | 3597 | 1-138  |
| HWLEN20 | 554 | 963418 | AL356734 | 3598 | 1-51<br>55-268   |
| HWLEN20 | 554 | 963418 | AL355388 | 3599 | 1-114  |
| HWLEN20 | 554 | 963418 | AL356734 | 3600 | 1-138  |



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| HWLEO59 | 555 | 974078 | AC004590 | 3601 | 1-227<br>237-962<br>1635-2011<br>2227-2464<br>2594-2702<br>3058-3363<br>4981-5183<br>6857-6945<br>7504-7921<br>7967-8221<br>8359-9282<br>9552-9683<br>10817-11045<br>11060-11319 |
| HWLEO59 | 555 | 974078 | AC004590 | 3602 | 1-569  |
| HWLEO59 | 555 | 974078 | AC004590 | 3603 | 1-496<br>1180-1555   |
| HWLEP95 | 556 | 751199 | AC023287 | 3604 | 1-473  |
| HWLEP95 | 556 | 751199 | AC012118 | 3605 | 1-473  |
| HWLEP95 | 556 | 751199 | AC023287 | 3606 | 1-250<br>1060-1374   |
| HWLEP95 | 556 | 751199 | AC012118 | 3607 | 1-54<br>109-250<br>1061-1374<br>2663-2767<br>2820-3116   |
| HWLEQ36 | 557 | 966250 | AC011405 | 3608 | 1-881<br>986-1165<br>3985-5285<br>5335-5688<br>6204-6681<br>8287-9016<br>9026-10953  |
| HWLEQ36 | 557 | 966250 | AC011405 | 3609 | 1-188  |
| HWLEQ36 | 557 | 966250 | AC011405 | 3610 | 1-559  |
| HWLER88 | 559 | 915168 | AC026593 | 3611 | 1-324  |
| HWLER88 | 559 | 915168 | AL365508 | 3612 | 1-323  |
| HWLER88 | 559 | 915168 | AL365508 | 3613 | 1-164  |
| HWLER88 | 559 | 915168 | AC026593 | 3614 | 1-296  |
| HWLFB08 | 560 | 849136 | AL133243 | 3615 | 1-607  |
| HWLFB08 | 560 | 849136 | AL133245 | 3616 | 1-607  |
| HWLFB08 | 560 | 849136 | AL133243 | 3617 | 1-457  |
| HWLFB08 | 560 | 849136 | AL133245 | 3618 | 1-457  |
| HWLFC80 | 561 | 830279 | AL360224 | 3619 | 1-571  |
| HWLFF40 | 563 | 830287 | AC012114 | 3620 | 1-314  |
| HWLFF40 | 563 | 830287 | AC009135 | 3621 | 1-314  |
| HWLFF40 | 563 | 830287 | AC005751 | 3622 | 1-314  |

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| HWLFF40  | 563 | 830287 | AC012114 | 3623 | 1-128  |
| HWLFF40  | 563 | 830287 | AC012114 | 3624 | 1-192  |
| HWLFF40  | 563 | 830287 | AC005751 | 3625 | 1-224<br>236-273   |
| HWLFF40  | 563 | 830287 | AC005751 | 3626 | 1-115  |
| HWLFF62  | 564 | 915155 | AC073957 | 3627 | 1-449  |
| HWLFJ51  | 566 | 853602 | AP001374 | 3628 | 1-496  |
| HWLFO70  | 568 | 756554 | AC019114 | 3629 | 1-423  |
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| HWLJL14 | 606 | 832205 | AP000450 | 3720 | 1-486  |
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| HWLKW04 | 620 | 969141 | AC016327 | 3744 | 1-165  |
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| HWLKW09 | 621 | 951716 | AC021865 | 3746 | 1-802  |
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| HWLMA84 | 630 | 929421 | AF067844 | 3760 | 1-169   |
| HWLPC29 | 632 | 965058 | AL049713 | 3761 | 1-83<br>2032-2121<br>2704-3023<br>4332-4487<br>5178-5340<br>5639-6325<br>7269-8537  |
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| HWMFG10 | 648 | 963406 | AL353644 | 3787 | 1-592   |
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| HWMIR03 | 661 | 922302 | AL354820 | 3818 | 1-87<br>142-514<br>635-1085<br>1089-1435  |
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| HWNEX05 | 677 | 928784 | AC053497 | 3849 | 1-300   |
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| HWNEY06 | 678 | 933551 | AC004219 | 3852 | 1-1013  |
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| HWNFZ48 | 679 | 933522 | AL135927 | 3855 | 1-626<br>2442-2539<br>2809-3257<br>3990-4295                                    |

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| HWNFZ48 | 679 | 933522 | AC007227 | 3856 | 1-626<br>2809-3259<br>3992-4297<br>4800-5206<br>5365-5973<br>7474-7831<br>12842-12947<br>13031-13570<br>15951-16111<br>16425-16579<br>18200-18337<br>19732-19864<br>20137-20313<br>20518-20656<br>21020-21772<br>21820-22109<br>22247-22363<br>22386-22568<br>22728-25424 |
| HWNFZ48 | 679 | 933522 | AL135927 | 3857 | 1-490   |
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| HWNHA12 | 681 | 969205 | AL354720 | 3861 | 1-729   |
| HWNHA12 | 681 | 969205 | AL354720 | 3862 | 1-531   |
| HWNHA12 | 681 | 969205 | AL354720 | 3863 | 1-463   |
| HWNDU11 | 685 | 965382 | AC025332 | 3864 | 1-723<br>734-3253   |
| HWNDU11 | 685 | 965382 | AC073532 | 3865 | 1-1075<br>1086-3606   |
| HWNDU11 | 685 | 965382 | AC025332 | 3866 | 1-155   |
| HWNDU11 | 685 | 965382 | AC073532 | 3867 | 1-1146  |

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| HWNDU11 | 685 | 965382 | AC073532 | 3868 | 1-155  |
| HWNBX05 | 687 | 928800 | AC010087 | 3869 | 1-393  |
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| HWNBL12 | 688 | 969222 | AC006344 | 3873 | 1-1064<br>3781-3919<br>7097-7283<br>7498-7654<br>8961-9886<br>9977-10228<br>11518-11855<br>12753-13066<br>13220-13320<br>16177-16549<br>17374-18638<br>19012-19459<br>19592-20212<br>20305-20887<br>21490-22435<br>22865-24404<br>25474-25626<br>28348-28745<br>29599-35135<br>35487-35810<br>37085-37167<br>37235-37611<br>38767-38872<br>39677-39970<br>40000-40446<br>40720-40950<br>41059-41784<br>42358-43037<br>44704-44803<br>45365-45659<br>46309-46749<br>46889-47004<br>47314-48426<br>48610-49113<br>49295-49473<br>49579-50118<br>50341-50536<br>52197-52445 |

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| HWNBL12 | 688 | 969222 | AC023303 | 3874 | 1-583  |
| HWNBL12 | 688 | 969222 | AC023303 | 3875 | 1-448  |
| HWNAL06 | 689 | 933591 | AC022133 | 3876 | 1-481  |
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| HWNAE01 | 690 | 914082 | AC027126 | 3878 | 1-1577   |
| HWNAE01 | 690 | 914082 | AC016333 | 3879 | 1-1577   |
| HWNAE01 | 690 | 914082 | AC016333 | 3880 | 1-412  |
| HWNAE01 | 690 | 914082 | AC016333 | 3881 | 1-490  |
| HWMBY62 | 692 | 937234 | AC011123 | 3882 | 1-1680   |
| HWMBY62 | 692 | 937234 | AP001562 | 3883 | 1-1678   |
| HWMBY62 | 692 | 937234 | AC011123 | 3884 | 1-381  |
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| HWMBY62 | 692 | 937234 | AP001562 | 3887 | 1-381  |
| HWMAE12 | 694 | 969692 | AC004601 | 3888 | 1-125<br>718-815<br>1493-1641<br>2613-3039<br>4587-4761<br>6771-6882<br>7077-7304<br>10590-10766 |
| HWMAE12 | 694 | 969692 | AC004601 | 3889 | 1-321<br>800-991<br>1104-2613  |
| HWMAE12 | 694 | 969692 | AC004601 | 3890 | 1-123  |
| HWLVU33 | 696 | 972979 | AC016757 | 3891 | 1-606  |
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| HWLVK02 | 697 | 922696 | AC026691 | 3893 | 1-1784   |
| HWLUY15 | 698 | 874966 | AC021094 | 3894 | 1-460  |
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| HWLUY15 | 698 | 874966 | AC021094 | 3896 | 1-650  |
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| HWLUY15 | 698 | 874966 | AC020664 | 3898 | 1-285  |
| HWLQS70 | 699 | 933799 | AL161797 | 3899 | 1-1465<br>6193-6379<br>7070-7221   |

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| HWLQS70 | 699 | 933799 | AL161797 | 3900 | 1-427  |
| HWLQA64 | 700 | 918932 | AC005575 | 3901 | 1-2866   |
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| HWLQA64 | 700 | 918932 | AC005575 | 3904 | 1-394  |
| HWLQA64 | 700 | 918932 | AC026272 | 3905 | 1-394  |
| HWLQA64 | 700 | 918932 | AC026272 | 3906 | 1-478  |
| HWLPN12 | 701 | 969572 | AC025758 | 3907 | 1-39<br>48-759<br>823-1016<br>1026-1055<br>1104-1457<br>2664-3918<br>4119-4739<br>5035-5940<br>6056-8229                         |
| HWLPN12 | 701 | 969572 | AC008810 | 3908 | 1-52<br>61-772<br>836-1064<br>1105-1458<br>2657-3914<br>4115-4735<br>4764-5963<br>6079-8001                                      |
| HWLPN12 | 701 | 969572 | AC008922 | 3909 | 1-52<br>61-772<br>836-1064<br>1105-1458<br>2662-3919<br>4120-4739<br>5035-5940<br>6056-9962                                      |
| HWLOL02 | 702 | 918320 | AC068942 | 3910 | 1-647  |
| HWLOL02 | 702 | 918320 | AC016590 | 3911 | 1-646  |
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| HWLOL02 | 702 | 918320 | AC012309 | 3915 | 1-91<br>978-1241<br>1533-1729<br>5127-5589<br>6986-7247<br>8381-8520<br>10408-10678<br>10698-10822<br>11589-11689<br>15587-15825 |

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| HWLNC88 | 704 | 875790 | AC074274 | 3916 | 1-729   |
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| HWLMI16 | 706 | 918726 | AC067952 | 3918 | 1-2563  |
| HWLMI16 | 706 | 918726 | AC025108 | 3919 | 1-2563  |
| HWLMI16 | 706 | 918726 | AC025108 | 3920 | 1-90<br>813-916<br>1268-1460<br>3661-4187   |
| HWLKQ11 | 710 | 965390 | AC012609 | 3921 | 1-960<br>2900-3067<br>5601-7348   |
| HWLKQ11 | 710 | 965390 | AC012609 | 3922 | 1-609   |
| HWLKQ11 | 710 | 965390 | AC012609 | 3923 | 1-455   |
| HWLKJ03 | 712 | 922371 | AL080276 | 3924 | 1-608   |
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| HWLJM40 | 717 | 710519 | AL357774 | 3926 | 1-2461  |
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| HWLJK01 | 718 | 914089 | AL353812 | 3928 | 1-1171  |
| HWLJK01 | 718 | 914089 | AL353812 | 3929 | 1-542<br>1063-1113<br>1121-1285<br>1289-1699<br>2521-2958<br>3073-3581  |
| HWLIG05 | 720 | 928226 | AC032015 | 3930 | 1-115<br>229-332<br>460-1278<br>2740-4294   |
| HWLIG05 | 720 | 928226 | AC032015 | 3931 | 1-507<br>1273-1517<br>2829-2947<br>3153-3378<br>3710-4111<br>4341-4548<br>4619-5121<br>5743-5880<br>6235-9287<br>9620-10060 |
| HWLID27 | 721 | 682563 | AL109758 | 3932 | 1-88<br>1532-1860<br>2113-2750  |
| HWLID27 | 721 | 682563 | AL109758 | 3933 | 1-996   |
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| HWLHU03 | 723 | 922931 | AC005073 | 3935 | 1-447   |

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| HWLHU03 | 723 | 922931 | AC005071 | 3936 | 1-447<br>1852-2062<br>2064-2154<br>2609-2977<br>3455-4244<br>4796-5218<br>6593-6924<br>9903-10133<br>11084-12000<br>12226-13392<br>13703-13772<br>13805-14443<br>14470-14888   |



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| HWLHH62 | 725 | 876225 | AC006479 | 3942 | 1-481   |
| HWLHH62 | 725 | 876225 | AC006479 | 3943 | 1-488   |
| HWLGA04 | 728 | 925682 | AC024339 | 3944 | 1-574   |
| HWLGA04 | 728 | 925682 | AL360230 | 3945 | 1-574   |
| HWLGA04 | 728 | 925682 | AL353576 | 3946 | 1-147<br>3046-3357<br>5595-5895<br>5898-9698<br>10511-11084<br>11199-12555<br>13710-14007<br>15469-15558  |
| HWLGA04 | 728 | 925682 | AC024339 | 3947 | 1-3656  |
| HWLGA04 | 728 | 925682 | AL360230 | 3948 | 1-147<br>3042-3356<br>5594-5894<br>5897-9551  |
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| HWLGA04 | 728 | 925682 | AL360230 | 3950 | 1-1355  |
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| HWLFY06 | 730 | 934635 | AC022211 | 3952 | 1-658   |
| HWLFY06 | 730 | 934635 | AC022211 | 3953 | 1-348   |
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| HWLFM69 | 733 | 754644 | AC009556 | 3955 | 1-973  |
| HWLFM69 | 733 | 754644 | AL359314 | 3956 | 1-973  |
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| HWLFM69 | 733 | 754644 | AC009556 | 3958 | 1-657  |
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| HWLFM69 | 733 | 754644 | AL161625 | 3961 | 1-435<br>1094-1713   |
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| HWLFM69 | 733 | 754644 | AL161625 | 3963 | 1-657  |
| HWLFB71 | 735 | 759915 | AC032007 | 3964 | 1-727  |
| HWLEZ11 | 736 | 966228 | AP001534 | 3965 | 1-757<br>951-2100  |
| HWLEZ11 | 736 | 966228 | AP001915 | 3966 | 1-757<br>951-2100  |
| HWLEZ11 | 736 | 966228 | AP001534 | 3967 | 1-582  |
| HWLEZ11 | 736 | 966228 | AP001915 | 3968 | 1-582  |
| HWLEI57 | 742 | 734267 | AL139329 | 3969 | 1-471  |
| HWLEI57 | 742 | 734267 | AL139329 | 3970 | 1-439  |
| HWLCM06 | 748 | 934117 | AC027590 | 3971 | 1-479  |
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| HWLBO06 | 751 | 934630 | AC016002 | 3974 | 1-828  |
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| HWLBL75 | 753 | 766877 | AC005206 | 3982 | 1-635<br>652-1989<br>2022-4665                                   |
| HWLBL75 | 753 | 766877 | AC005206 | 3983 | 1-106  |
| HWLBI01 | 754 | 919168 | AF053356 | 3984 | 1-71<br>234-304<br>320-826<br>878-1099<br>1233-1683<br>2077-3297 |
| HWLBI01 | 754 | 919168 | AF053356 | 3985 | 1-434  |
| HWLBI01 | 754 | 919168 | AF053356 | 3986 | 1-152  |
| HWLAU04 | 755 | 953433 | AC010446 | 3987 | 1-2080<br>2973-3106  |

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| HWLAQ11 | 756 | 966207 | AL356219 | 3988 | 1-568   |
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| HWLAC70 | 758 | 775771 | AL159140 | 3990 | 1-328   |
| HWLAC70 | 758 | 775771 | AL159140 | 3991 | 1-604<br>1036-2006<br>2061-2201<br>2725-3349  |
| HWLAC29 | 759 | 690263 | AC026468 | 3992 | 1-849<br>870-1491   |
| HWLAC29 | 759 | 690263 | AC026468 | 3993 | 1-365   |
| HWLAB74 | 760 | 765196 | AL357774 | 3994 | 1-1594  |
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| HWGQA42 | 761 | 713348 | AC073095 | 3996 | 1-583<br>997-1342   |
| HWGQA42 | 761 | 713348 | AC006353 | 3997 | 1-583<br>997-1340   |
| HWCAG11 | 762 | 966623 | AC018695 | 3998 | 1-142<br>1919-2798  |
| HWCAG11 | 762 | 966623 | AC009068 | 3999 | 1-142<br>1925-2804  |
| HWCAG11 | 762 | 966623 | AC018695 | 4000 | 1-129   |
| HWCAG11 | 762 | 966623 | AC009068 | 4001 | 1-129   |
| HVATY05 | 764 | 928713 | AJ239320 | 4002 | 1-655   |
| HVATY05 | 764 | 928713 | AJ239320 | 4003 | 1-54<br>1705-1902<br>3124-4382  |
| HVAPI01 | 766 | 913930 | AC010462 | 4004 | 1-773   |
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| HVAPI01 | 766 | 913930 | AC044796 | 4008 | 1-444   |
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| HVAET01 | 767 | 913958 | AL133243 | 4010 | 1-428   |
| HVAET01 | 767 | 913958 | AL133243 | 4011 | 1-218<br>1713-1892<br>2799-2896<br>3039-3242<br>4416-4668   |

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| HVAET01 | 767 | 913958 | AL133243 | 4012 | 1-502<br>891-997<br>3296-3521<br>5357-6137<br>7436-7920<br>8616-8765<br>9182-9311<br>10530-11068<br>11184-11626<br>12025-14398<br>14692-15155<br>15250-15383<br>15828-15994<br>17708-19731<br>19976-20476<br>21720-21860 |
| HVACY04 | 769 | 926473 | AC073253 | 4013 | 1-478<br>568-1003  |
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| HUFDO11 | 775 | 966407 | AC069236 | 4015 | 1-120<br>1649-1726<br>3402-4059<br>5672-6095<br>6358-6400<br>6416-6509<br>6661-6945<br>7544-7614<br>8193-10366   |
| HUFDO11 | 775 | 966407 | AC069236 | 4016 | 1-317  |
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| HUFDB03 | 778 | 923561 | AC044855 | 4026 | 1-509   |
| HUFDB03 | 778 | 923561 | AC069378 | 4027 | 1-509   |
| HUFDB03 | 778 | 923561 | AC012425 | 4028 | 1-509   |
| HUFDB03 | 778 | 923561 | AL132661 | 4029 | 1-509   |
| HUFBP22 | 782 | 582067 | AL355075 | 4030 | 1-514   |
| HUFBP22 | 782 | 582067 | AL355075 | 4031 | 1-173   |
| HUFAU90 | 784 | 787302 | AL138722 | 4032 | 1-956<br>979-1596   |
| HUFAU90 | 784 | 787302 | AL136125 | 4033 | 1-956<br>979-1596   |
| HUFAU90 | 784 | 787302 | AL136125 | 4034 | 1-122   |
| HUFAO77 | 785 | 772133 | AC004016 | 4035 | 1-273   |
| HUFAO77 | 785 | 772133 | AC004016 | 4036 | 1-102   |
| HUFAO77 | 785 | 772133 | AC004016 | 4037 | 1-276   |
| HUFAG52 | 788 | 727087 | AL158159 | 4038 | 1-351<br>353-2245   |
| HUFAG52 | 788 | 727087 | AL158159 | 4039 | 1-316   |
| HUFAG52 | 788 | 727087 | AL158159 | 4040 | 1-1093<br>2479-2639<br>3394-3520<br>4987-5316<br>5332-6160<br>8242-8371<br>9281-9645<br>11290-11446   |
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| HTPFF82 | 792 | 869864 | AC036110 | 4042 | 1-471   |
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| HTPFF82 | 792 | 869864 | AL160492 | 4044 | 1-1114<br>1954-2132   |
| HTPFF81 | 793 | 869862 | AC009244 | 4045 | 1-415   |
| HTPFF81 | 793 | 869862 | AC009397 | 4046 | 1-415   |
| HTPFF81 | 793 | 869862 | AC008770 | 4047 | 1-415   |
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| HTPFF81 | 793 | 869862 | AC009397 | 4049 | 1-547<br>754-814<br>1516-1769<br>2202-2959<br>3281-4012  |
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| HTPDA96 | 797 | 796101 | AC016526 | 4051 | 1-350<br>410-1937  |
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| HTPCV43 | 799 | 459467 | AC013472 | 4054 | 1-125<br>1118-1266<br>1885-2091<br>2585-2883<br>2974-3536<br>3666-3839<br>4067-4986  |
| HTPCR30 | 801 | 574757 | AC022214 | 4055 | 1-561<br>737-1154  |
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| HTPCE41 | 802 | 712642 | AC074091 | 4058 | 1-509  |
| HTPBD55 | 806 | 754147 | AC020988 | 4059 | 1-2211<br>2225-3110  |
| HTPBD55 | 806 | 754147 | AC020988 | 4060 | 1-318  |
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| HTPAP93 | 808 | 791415 | AL133215 | 4062 | 1-181<br>1710-1810<br>2434-2525<br>4747-4877<br>5346-5426<br>5763-6243<br>7288-7635<br>8274-8485<br>8491-8594<br>8691-8794<br>10019-10273<br>10365-10596<br>11095-11212<br>14099-14170 |

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| HSPAY58 | 819 | 964178 | AC037451 | 4086 | 1-591  |
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| HSPAI52 | 821 | 727212 | AC067894 | 4091 | 1-1967   |
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| HSODZ52 | 823 | 825096 | AC021937 | 4094 | 1-452<br>507-785<br>1010-1714  |
| HSODZ52 | 823 | 825096 | AC021937 | 4095 | 1-704  |
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| HSOBO01 | 835 | 882825 | AC011319 | 4115 | 1-315  |
| HSOBN03 | 836 | 923315 | AC017110 | 4116 | 1-747  |
| HSOBN03 | 836 | 923315 | AC008733 | 4117 | 1-747  |
| HSOBN03 | 836 | 923315 | AC009194 | 4118 | 1-747  |
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| HSOBM53 | 837 | 727811 | AL022725 | 4120 | 1-221  |
| HSOBK75 | 838 | 766940 | AC073608 | 4121 | 1-937  |
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| HSOBH84 | 840 | 782118 | AP001394 | 4128 | 1-166<br>1243-1645<br>4944-5333<br>5798-6008<br>7064-7454<br>8594-8780<br>9089-9312<br>9411-9596<br>11438-11783<br>12690-12861<br>13415-13604<br>14581-14741<br>22101-22624<br>23024-23372<br>25304-25401<br>25915-26052<br>27173-27649<br>28811-28920<br>29061-29727<br>32032-35779 |
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| HSOBE03 | 843 | 923322 | AF235095 | 4135 | 1-583   |

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| HSOAV11 | 847 | 967590 | AL133215 | 4140 | 1-565  |
| HSOAV11 | 847 | 967590 | AL138762 | 4141 | 1-245  |
| HSOAV11 | 847 | 967590 | AL138762 | 4142 | 1-291  |
| HSOAV11 | 847 | 967590 | AL133215 | 4143 | 1-284  |
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| HSOAM07 | 850 | 953954 | AL161453 | 4155 | 1-477  |
| HSOAG31 | 852 | 698357 | AC040174 | 4156 | 1-314  |
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| HSOAF76 | 853 | 877300 | AL161430 | 4160 | 1-430<br>1993-2414<br>2656-2821<br>2841-3200<br>3530-4320  |
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| HSOAF76 | 853 | 877300 | AL161430 | 4162 | 1-493  |
| HSOAF76 | 853 | 877300 | AC025797 | 4163 | 1-493  |
| HSIGK77 | 855 | 771815 | AL354898 | 4164 | 1-133<br>1003-1105<br>1134-1231<br>5096-5254<br>5536-5693<br>10173-10241<br>10560-11039<br>11536-11948 |
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| HSIGG42 | 859 | 713339 | AC008592 | 4172 | 1-683   |
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| HSIGF42 | 860 | 866561 | AL359818 | 4184 | 1-1103  |
| HSIGF42 | 860 | 866561 | AL138684 | 4185 | 1-1102  |
| HSIGF42 | 860 | 866561 | AL138684 | 4186 | 1-180   |
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| HSIGA25 | 862 | 677668 | AL355973 | 4188 | 1-1819  |
| HSIGA25 | 862 | 677668 | AC025100 | 4189 | 1-916<br>961-1365<br>1371-3189  |
| HSIGA25 | 862 | 677668 | AC000382 | 4190 | 1-916<br>961-1364<br>1370-3188  |
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| HSIGA25 | 862 | 677668 | AL355973 | 4192 | 1-280   |
| HSIGA25 | 862 | 677668 | AC025100 | 4193 | 1-280   |
| HSIGA25 | 862 | 677668 | AC000382 | 4194 | 1-643   |
| HSIGA25 | 862 | 677668 | AC000382 | 4195 | 1-281   |
| HSIFL30 | 868 | 691630 | U51561   | 4196 | 1-418   |

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| HSIFD30 | 871 | 691636 | AP001003 | 4198 | 1-2538  |
| HSIFD30 | 871 | 691636 | AP001156 | 4199 | 1-2538  |
| HSIFD30 | 871 | 691636 | AP001557 | 4200 | 1-2538  |
| HSIFD30 | 871 | 691636 | AP001003 | 4201 | 1-443   |
| HSIFD30 | 871 | 691636 | AP001156 | 4202 | 1-434   |
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| HSIED64 | 872 | 747012 | AC068289 | 4208 | 1-349   |
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| HSIDU10 | 876 | 866596 | AL161614 | 4214 | 1-887   |
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| HSIDQ95 | 878 | 795033 | AC015564 | 4216 | 1-1324  |
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| HSIDA48 | 883 | 721885 | AC004099 | 4218 | 1-173   |
| HSIDA48 | 883 | 721885 | AC004099 | 4219 | 1-378   |
| HSICU58 | 885 | 507172 | AL078644 | 4220 | 1-371<br>561-1011<br>1249-1857<br>2656-2908<br>6001-6230<br>6879-6997<br>7811-7947<br>8148-8324<br>8452-8523<br>9369-9565<br>9659-9836<br>10184-10314<br>10698-11355<br>11652-12814<br>13105-13769<br>14310-14546<br>14683-15524<br>15527-15936<br>16074-16355<br>16764-17327 |

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| HSICU58 | 885 | 507172 | AL356273 | 4221 | 1-166<br>514-644<br>1028-1685<br>1982-3144<br>3435-4099<br>4640-4876<br>5013-5854<br>5857-6266<br>6404-6685<br>7094-7657<br>7772-7976<br>8288-8547<br>8731-9316<br>9327-11445 |
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| HSIBB22 | 889 | 518673 | AP001808 | 4225 | 1-122<br>229-374<br>608-1333<br>1341-1595<br>4364-4472<br>5309-5535   |
| HSIBB22 | 889 | 518673 | AC012417 | 4226 | 1-725   |
| HSIBB22 | 889 | 518673 | AP002426 | 4227 | 1-725   |
| HSIBB22 | 889 | 518673 | AC012417 | 4228 | 1-255   |
| HSIBB22 | 889 | 518673 | AP002426 | 4229 | 1-255   |
| HSIAD11 | 895 | 964915 | AP002014 | 4230 | 1-1836  |
| HSIAD11 | 895 | 964915 | AC025086 | 4231 | 1-1836  |
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| HSIAD11 | 895 | 964915 | AP002014 | 4233 | 1-125   |
| HSIAD11 | 895 | 964915 | AC025086 | 4234 | 1-125   |
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| HSIAB63 | 896 | 745637 | AL049709 | 4236 | 1-456   |
| HSIAB05 | 897 | 932922 | AC011356 | 4237 | 1-223<br>1115-1373<br>1744-2421   |
| HSIAB05 | 897 | 932922 | AC011356 | 4238 | 1-198   |
| HSGBB01 | 898 | 916772 | AL079303 | 4239 | 1-619   |
| HSGBB01 | 898 | 916772 | AL079303 | 4240 | 1-361   |
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| HSGAA12 | 899 | 971541 | AC073655 | 4242 | 1-863   |
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| HRTAN72 | 903 | 766328 | AC031984 | 4249 | 1-367   |
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| HROEA06 | 910 | 934673 | AC007933 | 4270 | 1-2757  |
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| HROEA06 | 910 | 934673 | AC015912 | 4272 | 1-553   |
| HROEA06 | 910 | 934673 | AC007933 | 4273 | 1-556   |
| HRODY95 | 911 | 838830 | AL109827 | 4274 | 1-167<br>3707-4209<br>4491-4724<br>5912-5993<br>9579-13468<br>13539-16589<br>17762-17894<br>18778-19143<br>22182-22483<br>23261-23507 |



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| HRODE08 | 914 | 958532 | AC025335 | 4281 | 1-902  |
| HROCC67 | 916 | 751223 | AL035400 | 4282 | 1-909<br>923-1107<br>1421-1864<br>2258-3184<br>3266-3517<br>3761-4458  |
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| HROCC38 | 917 | 709348 | AC053518 | 4286 | 1-105<br>578-682<br>821-1222<br>2215-2374<br>2380-2491<br>2858-3322<br>3541-4224   |

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| HROBH25 | 927 | 677574 | AL356309 | 4309 | 1-408  |
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| HROAI61 | 940 | 742084 | AC021619 | 4325 | 1-307<br>894-1359<br>1488-1593<br>1791-2124<br>4206-4373<br>4719-4843<br>5364-5447<br>5480-5618<br>7701-7808<br>7883-8205 |
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| HNKCM03 | 952 | 922136 | AC016546 | 4337 | 1-605   |
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| HNKAZ51 | 953 | 947067 | AC012571 | 4339 | 1-96<br>3454-3811<br>4022-4342<br>5811-5851<br>6316-6456<br>7053-7225<br>10747-11007                                      |

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| HNKAO08 | 954 | 955691 | AC036236 | 4342 | 1-193                                     |
| HNKAO08 | 954 | 955691 | AL031003 | 4343 | 1-191                                     |
| HNKAO08 | 954 | 955691 | AL031003 | 4344 | 1-1526                                    |
| HNKAB83 | 955 | 914959 | AC024191 | 4345 | 1-284<br>1849-6056                        |
| HNKAB83 | 955 | 914959 | AC024191 | 4346 | 1-230                                     |
| HNJDR12 | 956 | 968978 | AC051640 | 4347 | 1-533                                     |
| HNJDR12 | 956 | 968978 | AC015928 | 4348 | 1-533                                     |
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| HNJBY05 | 958 | 928680 | AP000646 | 4351 | 1-946                                     |
| HNJBY05 | 958 | 928680 | AP000881 | 4352 | 1-946                                     |
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| HNALB10 | 960 | 968198 | AC073891 | 4357 | 1-1126                                    |
| HNALB10 | 960 | 968198 | AC011295 | 4358 | 1-1151                                    |
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| HNALB10 | 960 | 968198 | AC011295 | 4361 | 1-132                                     |
| HMZMD49 | 964 | 722624 | AC012137 | 4362 | 1-547<br>889-1313                         |
| HMZMD49 | 964 | 722624 | AL357060 | 4363 | 1-546<br>888-1312                         |
| HMZMD49 | 964 | 722624 | AC012137 | 4364 | 1-713                                     |
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| HMZMD49 | 964 | 722624 | AL357060 | 4366 | 1-96                                      |
| HMZAE53 | 965 | 868116 | AL161652 | 4367 | 1-432                                     |
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| HMZAC09 | 966 | 625188 | AL354988 | 4370 | 1-188<br>590-879                          |

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| HMZAC09 | 966 | 625188 | AL354988 | 4371 | 1-744  |
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| HLQHD03 | 971 | 856624 | AC012529 | 4374 | 1-2068   |
| HLQHD03 | 971 | 856624 | AC037452 | 4375 | 1-2065   |
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| HLQHD03 | 971 | 856624 | AC012529 | 4378 | 1-942  |
| HLQGZ73 | 972 | 856638 | AL354872 | 4379 | 1-829<br>884-1101<br>1244-1925<br>1982-2544  |
| HLQGZ73 | 972 | 856638 | AL354872 | 4380 | 1-186  |
| HLQGZ73 | 972 | 856638 | AL354872 | 4381 | 1-300  |
| HLQGU11 | 973 | 965781 | AL359963 | 4382 | 1-1637   |
| HLQGU11 | 973 | 965781 | AC013568 | 4383 | 1-1692   |
| HLQGU11 | 973 | 965781 | AL359963 | 4384 | 1-341  |
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| HLQGP25 | 974 | 893692 | AC040169 | 4387 | 1-679  |
| HLQGP25 | 974 | 893692 | AC009119 | 4388 | 1-679  |
| HLQGP25 | 974 | 893692 | AC009119 | 4389 | 1-521  |
| HLQGP25 | 974 | 893692 | AC040169 | 4390 | 1-521  |
| HLQGP25 | 974 | 893692 | AC009119 | 4391 | 1-404  |
| HLQGA01 | 976 | 915066 | AC069165 | 4392 | 1-750  |
| HLQGA01 | 976 | 915066 | AC069137 | 4393 | 1-750  |
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| HLQGA01 | 976 | 915066 | AC069137 | 4395 | 1-335  |
| HLQFS05 | 977 | 928264 | AC036160 | 4396 | 1-587  |
| HLQFS05 | 977 | 928264 | AC016995 | 4397 | 1-574  |
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| HLQFS05 | 977 | 928264 | AC016995 | 4399 | 1-140  |
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|         |     |        |          |      | 12812-13124<br>14222-14598<br>14771-15109<br>15446-15879<br>16642-16808<br>20797-21393   |
| HLQEW11 | 980 | 966019 | AC026407 | 4401 | 1-2070<br>5236-5514<br>5615-6079<br>6150-6586<br>7166-7197<br>7338-7999<br>9527-9700<br>10799-10983<br>12837-12971<br>14272-15865            |
| HLQEW11 | 980 | 966019 | AC026407 | 4402 | 1-514  |
| HLQEW11 | 980 | 966019 | AC026407 | 4403 | 1-2545   |
| HLQEN07 | 982 | 856733 | AC004621 | 4404 | 1-672  |
| HLQEN07 | 982 | 856733 | AC008695 | 4405 | 1-672  |
| HLQEN07 | 982 | 856733 | AC004621 | 4406 | 1-260  |
| HLQEN07 | 982 | 856733 | AC004621 | 4407 | 1-135  |
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| HLQED04 | 984 | 969543 | AC003034 | 4410 | 1-1463<br>2700-3046<br>4494-4613<br>4616-5228<br>5309-6063<br>6748-6856<br>6967-7111<br>8243-9122<br>9316-9516<br>10217-10299<br>11670-12309 |
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| HLQDV01 | 986 | 916190 | AC007281 | 4414 | 1-542  |
| HLQDV01 | 986 | 916190 | AC007281 | 4415 | 1-387  |

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| HLQDV01 | 986 | 916190 | AC007281 | 4416 | 1-467   |
| HLQDR89 | 989 | 972425 | AL359960 | 4417 | 1-795   |
| HLQDR89 | 989 | 972425 | AL137145 | 4418 | 1-795   |
| HLQDR89 | 989 | 972425 | AL359960 | 4419 | 1-748   |
| HLQDR89 | 989 | 972425 | AL137145 | 4420 | 1-748   |
| HLQDR47 | 990 | 720145 | AC011569 | 4421 | 1-350   |
| HLQDR47 | 990 | 720145 | AC025038 | 4422 | 1-350   |
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| HLQDR47 | 990 | 720145 | AC025038 | 4426 | 1-479   |
| HLQDQ72 | 992 | 973258 | AC011475 | 4427 | 1-3702<br>3734-3870<br>4167-8086<br>8380-8506<br>8629-8786<br>8878-9056<br>9150-9706<br>9716-9885<br>10225-11202<br>11285-11405<br>11976-12077<br>12488-12605<br>12618-13097<br>13227-13328<br>13715-13809<br>14933-15793<br>15840-16155<br>17915-18064<br>19573-19930<br>20884-21063<br>21218-21447<br>21813-21906 |
| HLQDQ72 | 992 | 973258 | AC011475 | 4428 | 1-100   |
| HLQDQ72 | 992 | 973258 | AC011475 | 4429 | 1-562   |
| HLQDP33 | 993 | 702276 | Z98200   | 4430 | 1-41<br>708-1009<br>1037-2004<br>2081-2760<br>3333-3499<br>4964-4998<br>5112-5277<br>6474-6938<br>7890-8188<br>8339-8418  |

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| HLQDP33 | 993  | 702276 | Z98200   | 4431 | 1-1284   |
| HLQDM03 | 995  | 923862 | AL365320 | 4432 | 1-309  |
| HLQDM03 | 995  | 923862 | AL122007 | 4433 | 1-309  |
| HLQDM03 | 995  | 923862 | AL365320 | 4434 | 1-312  |
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| HLQDI75 | 997  | 856759 | AC008439 | 4437 | 1-125  |
| HLQDF69 | 998  | 754302 | AC022900 | 4438 | 1-44<br>157-226<br>3041-3187<br>6070-6133<br>6234-8655<br>8907-10117   |
| HLQDF69 | 998  | 754302 | AC009431 | 4439 | 1-2185<br>2437-3647  |
| HLQDF69 | 998  | 754302 | AC022900 | 4440 | 1-140  |
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| HLQDF27 | 999  | 682896 | AL049652 | 4443 | 1-142<br>577-829   |
| HLQDE32 | 1000 | 707639 | AL136961 | 4444 | 1-1752   |
| HLQDE32 | 1000 | 707639 | AL136961 | 4445 | 1-633  |
| HLQCZ83 | 1003 | 781052 | AC007620 | 4446 | 1-995  |
| HLQCZ83 | 1003 | 781052 | AC007620 | 4447 | 1-349  |
| HLQCY79 | 1005 | 774827 | AC015918 | 4448 | 1-579  |
| HLQCY79 | 1005 | 774827 | AC026834 | 4449 | 1-640  |
| HLQCY79 | 1005 | 774827 | AC015918 | 4450 | 1-87   |
| HLQCY79 | 1005 | 774827 | AC026834 | 4451 | 1-115  |
| HLQCS58 | 1006 | 735841 | AC019259 | 4452 | 1-1543   |
| HLQCS58 | 1006 | 735841 | AL022395 | 4453 | 1-466<br>3482-3822<br>4489-4835<br>9658-10006<br>10629-10809<br>14666-15246<br>17973-18073<br>20754-20826<br>25652-25966<br>26380-27922<br>28216-28487<br>28737-29333<br>29428-29743<br>30589-31023<br>31154-32844 |
| HLQCS58 | 1006 | 735841 | AL022395 | 4454 | 1-1835   |



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| HLQCK45 | 1010 | 488499 | AL353800 | 4455 | 1-1719   |
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| HLQCK45 | 1010 | 488499 | AL353800 | 4457 | 1-732  |
| HLQCH67 | 1012 | 751481 | AC006977 | 4458 | 1-607<br>875-1251<br>2394-3112<br>4049-4536  |
| HLQCH67 | 1012 | 751481 | AC006977 | 4459 | 1-357  |
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| HLQBQ19 | 1014 | 671928 | AC064860 | 4461 | 1-415  |
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| HLQBQ19 | 1014 | 671928 | AC010134 | 4463 | 1-433  |
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| HLQBF91 | 1015 | 790408 | AC026871 | 4465 | 1-949  |
| HLQBF91 | 1015 | 790408 | AC026871 | 4466 | 1-4834   |
| HLQAX31 | 1017 | 693626 | AC002452 | 4467 | 1-675  |
| HLQAN75 | 1020 | 880815 | AL390764 | 4468 | 1-101<br>236-1007<br>1038-1344<br>1353-1493<br>1641-1750<br>1837-2006<br>2542-2700<br>3557-3720<br>4326-9299<br>9617-10008<br>10623-11068<br>11238-11714<br>11800-11992<br>12001-12566<br>13314-15677<br>15882-16457<br>16614-17442<br>17850-18427 |

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| HLQAN75 | 1020 | 880815 | AL359921 | 4469 | 1-375<br>1169-1310<br>1401-1702<br>3371-3412<br>4800-4925<br>5502-5646<br>6110-6402<br>7294-7448<br>7577-8348<br>8379-8685<br>8694-8834<br>8982-9091<br>9178-9347<br>9883-10041<br>10898-11061<br>11667-15866   |
| HLQAN75 | 1020 | 880815 | AL135843 | 4470 | 1-32<br>1420-1543<br>2122-2266<br>2730-3022<br>3914-4068<br>4197-4968<br>4999-5305<br>5314-5454<br>5602-5711<br>5798-5967<br>6503-6661<br>7518-7681<br>8287-13260<br>13578-13969<br>14584-15029<br>15199-15675<br>15761-15953<br>15962-16527<br>17275-19638<br>19843-20418<br>20575-21403 |
| HLQAN75 | 1020 | 880815 | AL136105 | 4471 | 1-32<br>1420-1543<br>2122-2266<br>2730-3022<br>3914-4068<br>4197-4968<br>4999-5305<br>5314-5454<br>5602-5711  |

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| HLQAN75 | 1020 | 880815 | AL390764 | 4472 | 1-287   |
| HLQAN75 | 1020 | 880815 | AL359921 | 4473 | 1-454   |
| HLQAN75 | 1020 | 880815 | AL135843 | 4474 | 1-302   |
| HLQAN75 | 1020 | 880815 | AL136105 | 4475 | 1-347<br>661-1203<br>1533-2057<br>2287-2445<br>3335-3716<br>5729-6044   |
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| HLPBA84 | 1021 | 912828 | AL354707 | 4477 | 1-446<br>1967-2228<br>2977-3459   |
| HLPBA84 | 1021 | 912828 | AL354707 | 4478 | 1-169<br>259-566  |
| HLPBA84 | 1021 | 912828 | AL354707 | 4479 | 1-492   |
| HLICS57 | 1023 | 734450 | AC008481 | 4480 | 1-227<br>2005-2722<br>3304-3403<br>3939-4507<br>4653-4882<br>5230-5288<br>5429-5833<br>6850-7703  |
| HLICS57 | 1023 | 734450 | AC008481 | 4481 | 1-464   |
| HLICJ60 | 1028 | 739746 | AC018630 | 4482 | 1-961   |
| HLICJ60 | 1028 | 739746 | AC018630 | 4483 | 1-394   |
| HLICJ60 | 1028 | 739746 | AC018630 | 4484 | 1-1240  |
| HLIBZ10 | 1029 | 963973 | AC027030 | 4485 | 1-340   |
| HLIBZ10 | 1029 | 963973 | AC027030 | 4486 | 1-448   |
| HLIBZ10 | 1029 | 963973 | AC027030 | 4487 | 1-772   |
| HLIBK17 | 1030 | 662438 | AL158842 | 4488 | 1-453   |
| HLIBK17 | 1030 | 662438 | AL158842 | 4489 | 1-1229  |

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| HLIBB54 | 1031 | 782180 | AC009027 | 4490 | 1-45<br>305-694<br>830-3497  |
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| HLIBB54 | 1031 | 782180 | AC009027 | 4493 | 1-2124   |
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| HLDRT92 | 1032 | 791215 | AC012344 | 4496 | 1-429<br>821-1364<br>2149-2201<br>2203-2598                                      |
| HLDRT92 | 1032 | 791215 | AC009560 | 4497 | 1-429<br>821-1364<br>2151-2203<br>2205-2600                                      |
| HLDRT92 | 1032 | 791215 | AC012344 | 4498 | 1-532  |
| HLDRT92 | 1032 | 791215 | AC009560 | 4499 | 1-532  |
| HLDRP58 | 1033 | 735731 | AC012474 | 4500 | 1-658  |
| HLDRP58 | 1033 | 735731 | AC009754 | 4501 | 1-168<br>975-1633<br>2930-3956<br>4337-6149                                      |
| HLDRP58 | 1033 | 735731 | AC025917 | 4502 | 1-168<br>975-1633<br>2930-3956<br>4337-6149                                      |
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| HLDRP58 | 1033 | 735731 | AC009754 | 4504 | 1-285  |
| HLDQV07 | 1034 | 952691 | AL157760 | 4505 | 1-435  |
| HLDQV07 | 1034 | 952691 | AL390029 | 4506 | 1-435<br>1195-1516   |
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| HLDQH68 | 1036 | 835571 | AC002352 | 4508 | 1-379<br>858-1086<br>1843-2418   |
| HLDPE31 | 1039 | 697969 | AC034190 | 4509 | 1-377<br>690-1196  |
| HLDPE31 | 1039 | 697969 | AC069069 | 4510 | 1-376  |

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| HLDPE31 | 1039 | 697969 | AC007920 | 4511 | 1-376<br>689-1194   |
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| HLDPE31 | 1039 | 697969 | AC069069 | 4514 | 1-394   |
| HLDPE31 | 1039 | 697969 | AC007920 | 4515 | 1-394   |
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| HLDOX46 | 1040 | 719023 | AF038458 | 4517 | 1-630<br>1311-1416<br>2481-4022<br>4952-5252<br>6370-6479<br>7623-8269  |
| HLDOS76 | 1042 | 770016 | AL121926 | 4518 | 1-203<br>1830-1953<br>2743-2933<br>3071-3533<br>4061-4265<br>5066-5270<br>5371-6058<br>6482-6626<br>6816-6942<br>7029-7116<br>7408-7737 |
| HLDOS76 | 1042 | 770016 | AL121926 | 4519 | 1-101   |
| HLDOS76 | 1042 | 770016 | AL121926 | 4520 | 1-463   |
| HLDOC67 | 1047 | 689240 | AC008481 | 4521 | 1-227<br>2005-2722<br>3304-3403<br>3939-4507<br>4653-4882<br>5230-5288<br>5429-5833<br>6850-7703  |
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| HLDNR75 | 1048 | 767294 | AP001124 | 4523 | 1-223<br>996-1562<br>1770-2368<br>2387-2959<br>3015-3123<br>3499-6406<br>7093-7404<br>7526-8527<br>8585-10046                           |
| HLDNR75 | 1048 | 767294 | AC010929 | 4524 | 1-1002  |
| HLDNR75 | 1048 | 767294 | AC010929 | 4525 | 1-1463  |

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| HLDNR75 | 1048 | 767294 | AC010929 | 4526 | 1-313   |
| HLDNR54 | 1049 | 729853 | AC002401 | 4527 | 1-547   |
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| HLDNR54 | 1049 | 729853 | AC002401 | 4529 | 1-145<br>1780-2184  |
| HLDDY07 | 1052 | 952751 | AL157773 | 4530 | 1-139<br>147-2377<br>3435-4231<br>4332-4673<br>4817-5164<br>5635-5749<br>6686-7213<br>7319-7546<br>7910-8192<br>8448-8545<br>8848-9085<br>11018-11079   |
| HLDDY07 | 1052 | 952751 | AC019053 | 4531 | 1-139<br>147-2376<br>3436-4232<br>4333-4674<br>4818-5165<br>5630-5744<br>6681-7208<br>7314-7541<br>7905-8187<br>8443-8540<br>8843-9080<br>11014-11075<br>12965-13243<br>13831-13911<br>13990-14093<br>14175-14299 |
| HLDDY07 | 1052 | 952751 | AL033397 | 4532 | 1-139<br>147-2376<br>3436-4232<br>4333-4674<br>4818-5165<br>5630-5744<br>6681-7208<br>7314-7541<br>7905-8187<br>8443-8540<br>8843-9080<br>11013-11074<br>12964-13242<br>13826-13910                               |

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| HLDDY07 | 1052 | 952751 | AC019053 | 4533 | 1-197   |
| HLDDY07 | 1052 | 952751 | AL157773 | 4534 | 1-78<br>511-796<br>1531-1713<br>3959-4059<br>4550-5232<br>6260-6670<br>7986-8045  |
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| HLDCW15 | 1054 | 705466 | AC026108 | 4536 | 1-942<br>950-1026<br>1069-2658<br>2713-2878<br>3584-3657<br>7735-8172<br>8227-8381<br>8388-8445<br>9541-10017<br>10072-10182<br>10911-10983<br>11557-11697<br>13705-15195<br>16125-17257<br>17310-17865 |
| HLDCW15 | 1054 | 705466 | AC069227 | 4537 | 1-438<br>493-647<br>1807-2283<br>2338-2448<br>3823-3963<br>5971-7460<br>8390-9289   |
| HLDCW15 | 1054 | 705466 | AC073157 | 4538 | 1-148<br>2155-3644<br>4574-5706<br>5759-6314  |
| HLDCW15 | 1054 | 705466 | AC073157 | 4539 | 1-455   |
| HLDCW15 | 1054 | 705466 | AC026108 | 4540 | 1-456   |
| HLDCU74 | 1055 | 765307 | AC010552 | 4541 | 1-124   |

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| HLDCU74 | 1055 | 765307 | AC007604 | 4542 | 1-124<br>204-348  |
| HLDCU74 | 1055 | 765307 | AC010552 | 4543 | 1-584<br>1055-1576<br>1787-1894<br>2122-2214<br>2235-2633<br>2694-3015<br>3459-3814   |
| HLDCU74 | 1055 | 765307 | AC010552 | 4544 | 1-128<br>465-972<br>1024-1240<br>1643-1841  |
| HLDCU74 | 1055 | 765307 | AC007604 | 4545 | 1-243   |
| HLDCE01 | 1056 | 916444 | AL360154 | 4546 | 1-297   |
| HLDCE01 | 1056 | 916444 | AC053486 | 4547 | 1-298   |
| HLDCE01 | 1056 | 916444 | AL360154 | 4548 | 1-372   |
| HLDCE01 | 1056 | 916444 | AC053486 | 4549 | 1-247<br>2052-2405  |
| HLDBW64 | 1057 | 746545 | AC067872 | 4550 | 1-747   |
| HLDBW64 | 1057 | 746545 | AC022958 | 4551 | 1-480   |
| HLDBV65 | 1058 | 764915 | AC034249 | 4552 | 1-53<br>159-352<br>440-544<br>949-1027<br>1365-1498<br>1745-1933<br>1944-1980<br>2105-2239<br>2503-3541                     |
| HLDBV65 | 1058 | 764915 | AC008926 | 4553 | 1-1055  |
| HLDBV65 | 1058 | 764915 | AC025179 | 4554 | 1-846<br>1168-1397<br>1419-1906<br>2084-2179<br>2677-2777<br>2883-3082  |



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| HLDBV65 | 1058 | 764915 | AC025179 | 4556 | 1-225  |
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| HLDBT71 | 1059 | 760347 | AL031666 | 4558 | 1-1235   |
| HLDBT71 | 1059 | 760347 | AL031666 | 4559 | 1-508  |
| HLDBT71 | 1059 | 760347 | AL031666 | 4560 | 1-648  |
| HLDBN55 | 1060 | 731734 | AL356742 | 4561 | 1-174<br>1171-1260<br>2295-4454  |
| HLDBN55 | 1060 | 731734 | AL121722 | 4562 | 1-174<br>1166-1255<br>2293-4450  |
| HLDBN55 | 1060 | 731734 | AL356742 | 4563 | 1-407  |
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| HLDBN38 | 1061 | 678424 | AF172277 | 4565 | 1-319<br>928-1709  |
| HLDBN38 | 1061 | 678424 | AC007567 | 4566 | 1-319<br>920-1701  |
| HLDBN38 | 1061 | 678424 | AF172277 | 4567 | 1-475  |
| HLDBN38 | 1061 | 678424 | AC007567 | 4568 | 1-475  |
| HLDBI09 | 1063 | 625542 | AP002026 | 4569 | 1-101<br>1898-2188<br>2968-3075<br>3091-3391<br>5480-5630<br>6238-6790<br>7155-7685<br>8249-8822<br>8936-9158<br>10306-10567<br>11652-11789<br>12209-12653 |

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| HLDBI09 | 1063 | 625542 | AP002026 | 4570 | 1-266   |
| HLDBE09 | 1064 | 625554 | AL355975 | 4571 | 1-322   |
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| HLDBE09 | 1064 | 625554 | AL136171 | 4573 | 1-61  |
| HLDBE09 | 1064 | 625554 | AC068682 | 4574 | 1-153   |
| HLDBE09 | 1064 | 625554 | AC016142 | 4575 | 1-150   |
| HLDBE09 | 1064 | 625554 | AC072051 | 4576 | 1-310   |
| HLDBE09 | 1064 | 625554 | AC034243 | 4577 | 1-312<br>2334-2364  |
| HLDBE09 | 1064 | 625554 | AC023309 | 4578 | 1-193   |
| HLDBE09 | 1064 | 625554 | AC009899 | 4579 | 1-175   |
| HLDBE09 | 1064 | 625554 | AC073446 | 4580 | 1-140   |
| HLDBE09 | 1064 | 625554 | AC019092 | 4581 | 1-184   |
| HLDBE09 | 1064 | 625554 | AL162741 | 4582 | 1-45  |
| HLDBE09 | 1064 | 625554 | AC008055 | 4583 | 1-919   |
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| HLDBE09 | 1064 | 625554 | AC019092 | 4585 | 1-268   |
| HLDBE09 | 1064 | 625554 | AL162741 | 4586 | 1-102   |
| HLDBD09 | 1065 | 625551 | AC005390 | 4587 | 1-105<br>116-577<br>839-1306<br>1880-2378<br>3636-3913<br>4067-4170<br>4664-4815<br>4918-5053<br>5153-5241<br>5427-5512 |
| HLDBD09 | 1065 | 625551 | AC005390 | 4588 | 1-393   |
| HLDBD09 | 1065 | 625551 | AC005390 | 4589 | 1-90  |
| HLDBD02 | 1066 | 920039 | AC023648 | 4590 | 1-1547  |
| HLDBD02 | 1066 | 920039 | AC008121 | 4591 | 1-2600  |
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| HLDBD02 | 1066 | 920039 | AC008121 | 4594 | 1-174<br>372-628  |
| HLDBC10 | 1067 | 964582 | AP000962 | 4595 | 1-467   |
| HLDBC10 | 1067 | 964582 | AP000962 | 4596 | 1-563   |
| HLDBB08 | 1069 | 959385 | AC007897 | 4597 | 1-206   |
| HLDBB08 | 1069 | 959385 | AC022221 | 4598 | 1-207   |
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| HLDBB08 | 1069 | 959385 | AC007897 | 4601 | 1-339               |
| HLDV38  | 1070 | 736027 | AC025712 | 4602 | 1-1822<br>1892-2371 |
| HLDV38  | 1071 | 709140 | AC036191 | 4603 | 1-146               |
| HLDV38  | 1071 | 709140 | AC068657 | 4604 | 1-106               |
| HLDV38  | 1071 | 709140 | AC022850 | 4605 | 1-93                |
| HLDV38  | 1071 | 709140 | AC023329 | 4606 | 1-101               |
| HLDV38  | 1071 | 709140 | AC023230 | 4607 | 1-105               |
| HLDV38  | 1071 | 709140 | AC073076 | 4608 | 1-32                |
| HLDV38  | 1071 | 709140 | AC037451 | 4609 | 1-89                |
| HLDV38  | 1071 | 709140 | AC016124 | 4610 | 1-98                |
| HLDV38  | 1071 | 709140 | AL355501 | 4611 | 1-201               |
| HLDV38  | 1071 | 709140 | AC069380 | 4612 | 1-238               |
| HLDV38  | 1071 | 709140 | AC026507 | 4613 | 1-100               |
| HLDV38  | 1071 | 709140 | AC069191 | 4614 | 1-102               |
| HLDV38  | 1071 | 709140 | AC008738 | 4615 | 1-90                |
| HLDV38  | 1071 | 709140 | AC022315 | 4616 | 1-106               |
| HLDV38  | 1071 | 709140 | AC068152 | 4617 | 1-104               |
| HLDV38  | 1071 | 709140 | AC023232 | 4618 | 1-127               |
| HLDV38  | 1071 | 709140 | AC025302 | 4619 | 1-108               |
| HLDV38  | 1071 | 709140 | AC009997 | 4620 | 1-117               |
| HLDV38  | 1071 | 709140 | AC009660 | 4621 | 1-477               |
| HLDV38  | 1071 | 709140 | AC060763 | 4622 | 1-129               |
| HLDV38  | 1071 | 709140 | AL357519 | 4623 | 1-100               |
| HLDV38  | 1071 | 709140 | AC027725 | 4624 | 1-86                |
| HLDV38  | 1071 | 709140 | AL353799 | 4625 | 1-97                |
| HLDV38  | 1071 | 709140 | AC010149 | 4626 | 1-91                |
| HLDV38  | 1071 | 709140 | AC068884 | 4627 | 1-122               |
| HLDV38  | 1071 | 709140 | AC020991 | 4628 | 1-86                |
| HLDV38  | 1071 | 709140 | AL354733 | 4629 | 1-50                |
| HLDV38  | 1071 | 709140 | AC067847 | 4630 | 1-96                |
| HLDV38  | 1071 | 709140 | AC007022 | 4631 | 1-89                |
| HLDV38  | 1071 | 709140 | AL021939 | 4632 | 1-68                |
| HLDV38  | 1071 | 709140 | AL354991 | 4633 | 1-107               |
| HLDV38  | 1071 | 709140 | AC068397 | 4634 | 1-477               |
| HLDV38  | 1071 | 709140 | AC015884 | 4635 | 1-207               |
| HLDV38  | 1071 | 709140 | AC024659 | 4636 | 1-109               |
| HLDV38  | 1071 | 709140 | AC040893 | 4637 | 1-95                |
| HLDV38  | 1071 | 709140 | AC012681 | 4638 | 1-477               |
| HLDV38  | 1071 | 709140 | AL031622 | 4639 | 1-221               |
| HLDV38  | 1071 | 709140 | AL035087 | 4640 | 1-66                |
| HLDV38  | 1071 | 709140 | AC068397 | 4641 | 1-411               |
| HLDV38  | 1071 | 709140 | AC015884 | 4642 | 1-131               |
| HLDV38  | 1071 | 709140 | AC023232 | 4643 | 1-105               |
| HLDV13  | 1072 | 657191 | AC021312 | 4644 | 1-472               |
| HLDV13  | 1072 | 657191 | AC011405 | 4645 | 1-471               |

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| HLDV13   | 1072 | 657191 | AC011405 | 4646 | 1-738   |
| HLDV13   | 1072 | 657191 | AC011405 | 4647 | 1-534   |
| HLDV01   | 1073 | 916462 | AC011004 | 4648 | 1-1182  |
| HLDV01   | 1073 | 916462 | AC011004 | 4649 | 1-289   |
| HLDV01   | 1073 | 916462 | AC011004 | 4650 | 1-190   |
| HLDAR12  | 1074 | 970634 | AC055739 | 4651 | 1-486   |
| HLDAR12  | 1074 | 970634 | AC068978 | 4652 | 1-486   |
| HLDAR12  | 1074 | 970634 | AC055739 | 4653 | 1-347   |
| HLDAR12  | 1074 | 970634 | AC068978 | 4654 | 1-347   |
| HKCTA23  | 1078 | 877228 | AC009293 | 4655 | 1-1453  |
| HKCTA23  | 1078 | 877228 | AC036167 | 4656 | 1-1455  |
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| HISCO10  | 1088 | 964285 | AC003090 | 4664 | 1-710   |
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| HISBZ83  | 1094 | 781018 | AC012141 | 4669 | 1-404<br>728-1560   |
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| HISBW78  | 1095 | 840252 | AC016561 | 4672 | 1-383   |
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| HHLAB49 | 1130 | 723222 | AC006360 | 4764 | 1-516                          |
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| HGBHM39 | 1136 | 705606 | AP000272 | 4785 | 1-504                          |
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| HGBHM39 | 1136 | 705606 | AP000180 | 4787 | 1-504                          |
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| HGBHM39 | 1136 | 705606 | AP000104 | 4792 | 1-391                          |
| HGBHM39 | 1136 | 705606 | AP000180 | 4793 | 1-391                          |
| HGBHM18 | 1137 | 854310 | AC010210 | 4794 | 1-619<br>631-1113<br>1534-2711 |
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| HGBHE82 | 1140 | 780030 | AC027045 | 4796 | 1-1506                         |

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| HGBHE68 | 1141 | 753200 | AL117259 | 4798 | 1-466<br>651-1202<br>1233-1913<br>3395-3722<br>3932-4088<br>6037-6881   |
| HGBHE68 | 1141 | 753200 | AL117259 | 4799 | 1-81<br>2627-2954   |
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| HGBHD89 | 1142 | 493910 | AC062024 | 4801 | 1-372<br>971-1730<br>2232-2771  |
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| HGBHD89 | 1142 | 493910 | AC062024 | 4804 | 1-186   |
| HGBHD89 | 1142 | 493910 | AL159177 | 4805 | 1-186   |
| HGBHD89 | 1142 | 493910 | AL031447 | 4806 | 1-242   |
| HGBGZ03 | 1145 | 924788 | AL158210 | 4807 | 1-661<br>945-1531   |
| HGBGZ03 | 1145 | 924788 | AC015686 | 4808 | 1-661<br>945-1531   |

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| HGBGM71 | 1147 | 576919 | AC016331 | 4815 | 1-63<br>321-500<br>1262-1335<br>2182-3835<br>3950-4159<br>4296-4362<br>4408-5912<br>6011-6085<br>6526-6823<br>6837-7640              |
| HGBGM71 | 1147 | 576919 | AC010503 | 4816 | 1-63<br>321-500<br>1262-1335<br>2182-3835<br>3950-4159<br>4296-4362<br>4408-5912<br>6011-6085<br>6532-6830<br>6844-7647<br>8439-8764 |
| HGBGM71 | 1147 | 576919 | AC016331 | 4817 | 1-124  |
| HGBGM71 | 1147 | 576919 | AC010503 | 4818 | 1-124  |
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| HGBGL83 | 1148 | 638178 | AC018785 | 4820 | 1-648  |
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| HGBGL35 | 1149 | 707128 | AL354863 | 4825 | 1-123<br>201-685<br>933-1040<br>1110-2225  |
| HGBGL35 | 1149 | 707128 | AC005385 | 4826 | 1-35<br>47-312<br>376-582<br>4902-5078<br>5885-6126  |

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| HGBGL35 | 1149 | 707128 | AL365498 | 4827 | 1-123<br>201-684<br>931-1038<br>1108-3186<br>3377-3923   |
| HGBGL35 | 1149 | 707128 | AC005385 | 4828 | 1-170  |
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| HGBGL19 | 1150 | 671668 | AC024930 | 4832 | 1-538<br>699-1139<br>1611-2347<br>2373-5149  |
| HGBFP63 | 1151 | 745487 | AL118558 | 4833 | 1-52<br>610-793<br>3573-3747<br>3974-4246<br>4617-4809<br>7257-7549<br>7639-7729   |
| HGBDY85 | 1154 | 784615 | AF276759 | 4834 | 1-1613   |
| HGBDY85 | 1154 | 784615 | AC019031 | 4835 | 1-1613   |
| HGBDY85 | 1154 | 784615 | AF276759 | 4836 | 1-561  |
| HGBDY85 | 1154 | 784615 | AC019031 | 4837 | 1-561  |
| HGBDU06 | 1155 | 960558 | AC016772 | 4838 | 1-33<br>140-447<br>1060-1290<br>1811-2343<br>2595-3147<br>5729-6499  |
| HGBDU06 | 1155 | 960558 | AC016772 | 4839 | 1-295  |
| HGBDM36 | 1156 | 707917 | AL133153 | 4840 | 1-66<br>3505-4125  |

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| HGBDM36 | 1156 | 707917 | AL133153 | 4841 | 1-326  |
| HGBDL39 | 1157 | 710349 | AC023487 | 4842 | 1-601  |
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| HGBDG15 | 1158 | 660743 | AC072027 | 4845 | 1-139<br>743-1217<br>1272-1399<br>1401-2002<br>2300-5776   |
| HGBDG15 | 1158 | 660743 | AC068577 | 4846 | 1-174<br>1098-1325<br>1752-1892<br>2493-2967<br>3022-3149<br>3151-3752<br>4052-7639  |
| HGBDG11 | 1159 | 964929 | AC007938 | 4847 | 1-2480<br>2706-2809<br>2817-5345<br>6083-6147<br>6181-7832<br>8092-8454<br>8509-9020   |

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|         |      |        |          |      | 9028-9479<br>9549-9637<br>9833-10202<br>10261-10701<br>10866-11663<br>11802-11942<br>12063-12403<br>12516-12649<br>12700-13080<br>14558-15133<br>17738-18010<br>18595-18678 |
| HGBDG11 | 1159 | 964929 | AC007938 | 4848 | 1-110<br>985-1373<br>1838-2238<br>2600-3298   |
| HGBDG11 | 1159 | 964929 | AC007938 | 4849 | 1-906   |
| HGBCU53 | 1160 | 871948 | AL160231 | 4850 | 1-1745  |
| HGBCU53 | 1160 | 871948 | AL160231 | 4851 | 1-1350<br>1639-2494   |
| HGBCU53 | 1160 | 871948 | AL160231 | 4852 | 1-514   |
| HGBCS41 | 1161 | 711528 | AC016463 | 4853 | 1-425   |
| HGBCS41 | 1161 | 711528 | AC078778 | 4854 | 1-2274  |
| HGBCS41 | 1161 | 711528 | AC016463 | 4855 | 1-304   |
| HGBBP65 | 1162 | 753956 | AC023766 | 4856 | 1-649   |
| HGBBP65 | 1162 | 753956 | AC021108 | 4857 | 1-649   |
| HGBBP65 | 1162 | 753956 | AC068887 | 4858 | 1-649   |
| HGBBP65 | 1162 | 753956 | AC023766 | 4859 | 1-414   |
| HGBBP65 | 1162 | 753956 | AC023766 | 4860 | 1-256   |
| HGBBP65 | 1162 | 753956 | AC021108 | 4861 | 1-256   |
| HGBBP65 | 1162 | 753956 | AC068887 | 4862 | 1-256   |
| HGBBP65 | 1162 | 753956 | AC068887 | 4863 | 1-414   |
| HGBBG33 | 1163 | 702930 | AC007450 | 4864 | 1-661<br>1513-1793<br>3868-3958   |
| HGBBG33 | 1163 | 702930 | AC007450 | 4865 | 1-403   |
| HGBBG33 | 1163 | 702930 | AC007450 | 4866 | 1-890   |
| HGBAJ77 | 1165 | 772756 | AL162586 | 4867 | 1-92<br>242-439<br>788-1450<br>1535-1583<br>1667-1942<br>2166-2458<br>2555-3264<br>3414-3947<br>4005-4122<br>4241-4323  |

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| HGBAJ77 | 1165 | 772756 | AL162586 | 4868 | 1-371  |
| HGAMC08 | 1168 | 958490 | AC008174 | 4869 | 1-351  |
| HGAMC08 | 1168 | 958490 | AC008174 | 4870 | 1-463  |
| HFVJW07 | 1170 | 951883 | AC036214 | 4871 | 1-225<br>684-919<br>1025-1542<br>1986-2693   |
| HFVJW07 | 1170 | 951883 | AC018952 | 4872 | 1-225<br>684-919<br>1025-1542<br>1986-2693   |
| HFVJW07 | 1170 | 951883 | AC036214 | 4873 | 1-100  |
| HFVJW07 | 1170 | 951883 | AC018952 | 4874 | 1-90   |
| HFVIP01 | 1171 | 914567 | AF267169 | 4875 | 1-187<br>632-1013<br>1430-1516<br>2138-2236<br>4981-5178<br>5948-6423<br>7410-7564<br>8801-8916<br>10587-10760<br>13561-13805<br>14535-14973<br>16194-16326<br>17706-18167<br>20341-20456<br>21993-22161<br>22238-22315<br>23495-23581<br>23869-23982<br>24720-24768 |
| HFVID08 | 1173 | 959739 | AL139424 | 4876 | 1-518  |
| HFVID08 | 1173 | 959739 | AL354956 | 4877 | 1-518  |
| HFVID08 | 1173 | 959739 | AP001098 | 4878 | 1-519  |
| HFVID08 | 1173 | 959739 | AL139424 | 4879 | 1-184<br>465-947<br>1451-1547  |
| HFVID08 | 1173 | 959739 | AL354956 | 4880 | 1-87   |
| HFVID08 | 1173 | 959739 | AL139424 | 4881 | 1-87   |



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| HFVID08 | 1173 | 959739 | AL354956 | 4882 | 1-121<br>728-1210<br>1462-1753<br>2251-2540<br>3707-3907<br>4171-4653<br>5157-5254  |
| HFVID08 | 1173 | 959739 | AP001098 | 4883 | 1-87  |
| HFVIC84 | 1174 | 783131 | AL137838 | 4884 | 1-1313  |
| HFVIC84 | 1174 | 783131 | AL357497 | 4885 | 1-1312  |
| HFVIC84 | 1174 | 783131 | AL121955 | 4886 | 1-48<br>1820-2272<br>5256-5334<br>5802-5900<br>8568-8654<br>9056-9587<br>10243-10417<br>11007-11107<br>11236-11537<br>12632-12779<br>13023-13505<br>14983-15107<br>17710-21082<br>21618-22251<br>22477-23328<br>23353-24664 |
| HFVIC84 | 1174 | 783131 | AL137838 | 4887 | 1-830   |
| HFVIC84 | 1174 | 783131 | AL357497 | 4888 | 1-852   |
| HFVIC30 | 1175 | 881306 | AC026532 | 4889 | 1-163<br>671-886<br>1126-1321<br>1666-2128<br>2507-2716<br>3141-4654<br>4688-4786<br>5166-5602  |
| HFVIC30 | 1175 | 881306 | AC026532 | 4890 | 1-376   |
| HFVIC30 | 1175 | 881306 | AC026532 | 4891 | 1-864   |
| HFVHX74 | 1176 | 854533 | AC016498 | 4892 | 1-1041<br>1762-2148<br>3472-3587<br>5453-5549<br>6054-6206<br>6459-6764<br>8027-8438<br>9092-9355<br>9588-9697  |

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| HFVHX74 | 1176 | 854533 | AP001130 | 4893 | 1-158<br>463-870<br>1004-1838  |
| HFVHX74 | 1176 | 854533 | AC016498 | 4894 | 1-546  |
| HFVHX74 | 1176 | 854533 | AP001130 | 4895 | 1-546  |
| HFVHX74 | 1176 | 854533 | AP001130 | 4896 | 1-847  |

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| HFVHR05 | 1178 | 932181 | AC012251 | 4897 | 1-1623  |
| HFVHR05 | 1178 | 932181 | AC009557 | 4898 | 1-644   |
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| HFVHR05 | 1178 | 932181 | AC009557 | 4900 | 1-179   |
| HFVGM12 | 1181 | 971182 | AL358773 | 4901 | 1-2493  |
| HFVGM12 | 1181 | 971182 | AL356607 | 4902 | 1-1712  |
| HFVGM12 | 1181 | 971182 | AL358773 | 4903 | 1-1516  |
| HFLUE22 | 1185 | 522779 | AC078803 | 4904 | 1-216   |
| HFLUE22 | 1185 | 522779 | AC078803 | 4905 | 1-309<br>3508-3802  |
| HFLUE22 | 1185 | 522779 | AC078803 | 4906 | 1-679   |
| HFLQJ68 | 1187 | 753216 | AC023761 | 4907 | 1-245<br>382-523  |
| HFLQJ68 | 1187 | 753216 | AC021823 | 4908 | 1-245<br>382-523  |
| HFLQJ68 | 1187 | 753216 | AC021823 | 4909 | 1-399   |
| HFLQJ68 | 1187 | 753216 | AC023761 | 4910 | 1-399   |
| HEPNE51 | 1189 | 855589 | AC012663 | 4911 | 1-557   |
| HEPNE51 | 1189 | 855589 | AC012663 | 4912 | 1-3830  |
| HDRMD24 | 1190 | 676826 | AC016884 | 4913 | 1-537<br>592-1543<br>2094-2195<br>2274-2590<br>2598-3078  |
| HDRMD24 | 1190 | 676826 | AC016884 | 4914 | 1-542   |
| HDRMD24 | 1190 | 676826 | AC016884 | 4915 | 1-1148  |
| HDRMA68 | 1191 | 785478 | AC005848 | 4916 | 1-164<br>343-428<br>578-2903<br>3020-3168<br>4072-4415<br>5074-5526<br>5547-5780  |
| HDRMA68 | 1191 | 785478 | AC005848 | 4917 | 1-863<br>1241-1590<br>1666-2167<br>2328-2424<br>2500-2950<br>3000-3341<br>3351-3962<br>3976-3995<br>4276-5430<br>5485-5585<br>5616-5892<br>6622-6727<br>7156-8018 |
| HDDAF49 | 1193 | 911314 | AC068243 | 4918 | 1-910   |

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| HDDAF49 | 1193 | 911314 | AC068243 | 4919 | 1-474  |
| HDDAE06 | 1194 | 954683 | AL139012 | 4920 | 1-882  |
| HDDAE06 | 1194 | 954683 | AL139012 | 4921 | 1-634  |
| HDDAE06 | 1194 | 954683 | AL139012 | 4922 | 1-277  |
| HDDAC56 | 1195 | 733673 | AC012443 | 4923 | 1-558  |
| HDDAB07 | 1197 | 954150 | AC026075 | 4924 | 1-561  |
| HDDAB07 | 1197 | 954150 | AC026075 | 4925 | 1-516  |
| HCYBL79 | 1199 | 888275 | AL162261 | 4926 | 1-454  |
| HCYBL79 | 1199 | 888275 | AC015618 | 4927 | 1-453  |
| HCYBL79 | 1199 | 888275 | AL356957 | 4928 | 1-2000<br>2791-3036  |
| HCYBL79 | 1199 | 888275 | AL358813 | 4929 | 1-154<br>168-272<br>2427-2570<br>3307-3955<br>4488-4638<br>4640-5508<br>5813-6298<br>6577-8556                           |
| HCYBL79 | 1199 | 888275 | AC018593 | 4930 | 1-154<br>168-272<br>2428-2571<br>3308-3956<br>4489-4639<br>4641-5509<br>5814-6299<br>6578-8557                           |
| HCYBL79 | 1199 | 888275 | AC024468 | 4931 | 1-269<br>2419-2560<br>3305-3786<br>4474-5582<br>5736-6454<br>6554-8813<br>9717-9903                                      |
| HCYBL79 | 1199 | 888275 | AL354666 | 4932 | 1-455  |
| HCYBL79 | 1199 | 888275 | AL162612 | 4933 | 1-155<br>168-272<br>2427-2570<br>3309-3957<br>4477-4628<br>4630-4944<br>4986-5499<br>5827-6313<br>6597-8596<br>9375-9620 |
| HCYBL79 | 1199 | 888275 | AL355800 | 4934 | 1-453  |
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| HCYBL79 | 1199 | 888275 | AL021920 | 4936 | 1-455  |
| HCYBL79 | 1199 | 888275 | AL355149 | 4937 | 1-454  |
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| HCYBL79 | 1199 | 888275 | AL137802 | 4939 | 1-454  |
| HCYBL79 | 1199 | 888275 | AL356957 | 4940 | 1-379  |
| HCYBL79 | 1199 | 888275 | AL358813 | 4941 | 1-246  |
| HCYBL79 | 1199 | 888275 | AL162261 | 4942 | 1-901<br>1073-1200<br>1220-1344<br>1713-2288 |
| HCYBL79 | 1199 | 888275 | AC018593 | 4943 | 1-579  |
| HCYBL79 | 1199 | 888275 | AC015618 | 4944 | 1-475<br>1079-1217<br>1702-2277              |
| HCYBL79 | 1199 | 888275 | AL356957 | 4945 | 1-485  |
| HCYBL79 | 1199 | 888275 | AL358813 | 4946 | 1-579  |
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| HCYBL79 | 1199 | 888275 | AC024468 | 4948 | 1-478  |
| HCYBL79 | 1199 | 888275 | AL354666 | 4949 | 1-376  |
| HCYBL79 | 1199 | 888275 | AC024468 | 4950 | 1-835  |
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| HCRQB03 | 1200 | 922880 | AC011676 | 4961 | 1-574  |
| HCRQB03 | 1200 | 922880 | AC011676 | 4962 | 1-198  |
| HCRPQ40 | 1201 | 881408 | AC055713 | 4963 | 1-110<br>2616-2733<br>4199-6427              |
| HCRPQ40 | 1201 | 881408 | AC048340 | 4964 | 1-2230                                       |
| HCRPQ40 | 1201 | 881408 | AC055713 | 4965 | 1-247  |
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| HCROA43 | 1203 | 948286 | AC074373 | 4969 | 1-55<br>130-242<br>323-415<br>1103-1284<br>1397-1478<br>1831-2026<br>2418-3008  |
| HCROA43 | 1203 | 948286 | AC074373 | 4970 | 1-303   |
| HCRNR03 | 1204 | 922819 | AL139181 | 4971 | 1-43<br>946-1000<br>1203-1650<br>2360-2851  |
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| HCRNR03 | 1204 | 922819 | AL139185 | 4973 | 1-43<br>946-1000<br>1203-1650<br>2360-2851  |
| HCRNR03 | 1204 | 922819 | AL139185 | 4974 | 1-618   |
| HCRNR03 | 1204 | 922819 | AL139181 | 4975 | 1-618   |
| HCRMX10 | 1206 | 963663 | AC009093 | 4976 | 1-372<br>720-1405   |
| HCRMX10 | 1206 | 963663 | AC009130 | 4977 | 1-372<br>720-1405   |
| HCRMX10 | 1206 | 963663 | AC007615 | 4978 | 1-372<br>720-1405   |
| HCRMX10 | 1206 | 963663 | AC009093 | 4979 | 1-1003  |
| HCRMX10 | 1206 | 963663 | AC007615 | 4980 | 1-1003  |
| HCQDA13 | 1209 | 908299 | AP001574 | 4981 | 1-391<br>399-934<br>989-1474<br>1539-1808<br>1878-2473<br>2611-3878<br>4484-4887<br>5018-5164<br>6084-6248<br>6329-7340<br>7770-8529<br>10244-10365<br>10679-10999<br>11721-11928<br>12212-12605<br>12918-13928 |
| HCQDA13 | 1209 | 908299 | AC013608 | 4982 | 1-1010  |

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| HCQDA13 | 1209 | 908299 | AF235095 | 4983 | 1-151<br>465-782<br>1507-1714<br>1998-2391<br>2704-3714<br>3773-3952<br>4694-4962<br>5546-6784   |
| HCQDA13 | 1209 | 908299 | AC013608 | 4984 | 1-377  |
| HCQDA13 | 1209 | 908299 | AF235095 | 4985 | 1-760  |
| HCQDA13 | 1209 | 908299 | AP001574 | 4986 | 1-422  |
| HCQDA13 | 1209 | 908299 | AC013608 | 4987 | 1-394  |
| HCQCQ76 | 1210 | 953491 | AC027326 | 4988 | 1-1321<br>1363-2417  |
| HCQCQ76 | 1210 | 953491 | AC010622 | 4989 | 1-1315<br>1357-1981  |
| HCQCQ76 | 1210 | 953491 | AC027326 | 4990 | 1-225  |
| HCQCQ76 | 1210 | 953491 | AC010622 | 4991 | 1-3115   |
| HCQAC71 | 1211 | 951844 | AC018845 | 4992 | 1-111<br>281-657<br>1134-1623<br>1791-1965<br>3712-4015<br>6018-6383<br>7498-7672<br>9645-9802<br>9952-10439<br>12178-12300<br>13340-13871<br>14159-14747<br>14949-16552 |
| HCQAC71 | 1211 | 951844 | AC007338 | 4993 | 1-111<br>281-657<br>1134-1613<br>1791-1965<br>3712-4015<br>6018-6383<br>7498-7672<br>9645-9802<br>9952-10439<br>12178-12300<br>13340-13871<br>14159-14747<br>14949-16552 |

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| HCQAC71 | 1211 | 951844 | AC018845 | 4994 | 1-150  |
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| HCNSR78 | 1212 | 773818 | AL357078 | 4996 | 1-551  |
| HCNSR78 | 1212 | 773818 | AC025866 | 4997 | 1-551  |
| HCNSR78 | 1212 | 773818 | AL357078 | 4998 | 1-333  |
| HCNSR78 | 1212 | 773818 | AC025866 | 4999 | 1-333  |
| HCNSR32 | 1213 | 699694 | AC073041 | 5000 | 1-413  |
| HCNSR32 | 1213 | 699694 | AC073041 | 5001 | 1-538  |
| HCNSR32 | 1213 | 699694 | AC073041 | 5002 | 1-286  |
| HCNSE03 | 1214 | 925492 | AC026347 | 5003 | 1-954  |
| HCNSE03 | 1214 | 925492 | AC026347 | 5004 | 1-1101   |
| HCNDV73 | 1215 | 764119 | AC019310 | 5005 | 1-83<br>3708-4178<br>4287-4409<br>5057-5168<br>7946-8131<br>8252-8642<br>8735-9237<br>9607-9740<br>9794-10471<br>11799-12500 |
| HCNDV73 | 1215 | 764119 | AC019310 | 5006 | 1-371  |
| HCNDV73 | 1215 | 764119 | AC019310 | 5007 | 1-361  |
| HCNDV41 | 1216 | 862324 | AC024315 | 5008 | 1-627  |
| HCNDV41 | 1216 | 862324 | AL391001 | 5009 | 1-623  |
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| HCNDF65 | 1218 | 747499 | AL161911 | 5012 | 1-1368   |
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| HCNDF65 | 1218 | 747499 | AL161911 | 5014 | 1-298  |
| HCNDF65 | 1218 | 747499 | AL354792 | 5015 | 1-532  |
| HCNDF65 | 1218 | 747499 | AL354792 | 5016 | 1-2620   |
| HCNDB86 | 1219 | 785168 | AC026268 | 5017 | 1-548  |
| HCNDB86 | 1219 | 785168 | AC026268 | 5018 | 1-226  |
| HCNCX91 | 1220 | 789556 | AC009528 | 5019 | 1-1122   |
| HCNCX91 | 1220 | 789556 | AC009528 | 5020 | 1-309  |
| HCNCX27 | 1221 | 682479 | AC022834 | 5021 | 1-483  |
| HCNCX27 | 1221 | 682479 | AC022834 | 5022 | 1-478  |
| HCNCX27 | 1221 | 682479 | AC023214 | 5023 | 1-483  |
| HCNCX27 | 1221 | 682479 | AC023214 | 5024 | 1-345  |
| HCNCT03 | 1222 | 923344 | AL139155 | 5025 | 1-471  |
| HCNCO59 | 1223 | 738889 | AL133384 | 5026 | 1-841  |



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| HCNCF19 | 1225 | 668043 | AC016757 | 5027 | 1-825   |
| HCNCF19 | 1225 | 668043 | AC016757 | 5028 | 1-278   |
| HCNAZ20 | 1226 | 670031 | AC022744 | 5029 | 1-543   |
| HCNAZ20 | 1226 | 670031 | AC015531 | 5030 | 1-543   |
| HCNAZ20 | 1226 | 670031 | AC009588 | 5031 | 1-543   |
| HCNAZ20 | 1226 | 670031 | AC022744 | 5032 | 1-224   |
| HCNAZ20 | 1226 | 670031 | AC015531 | 5033 | 1-224   |
| HCNAZ20 | 1226 | 670031 | AC009588 | 5034 | 1-224   |
| HCNAT92 | 1228 | 518899 | AC025883 | 5035 | 1-108<br>447-498<br>2019-2265   |
| HCNAT92 | 1228 | 518899 | AC025883 | 5036 | 1-376   |
| HCNAT67 | 1229 | 508295 | AC027678 | 5037 | 1-94<br>1661-1725<br>5796-6058<br>6224-6585<br>7182-7626  |
| HCNAT67 | 1229 | 508295 | AC022390 | 5038 | 1-192<br>1664-1728<br>5801-6062<br>6228-6589<br>7186-10078  |
| HCNAQ26 | 1230 | 685199 | AC072035 | 5039 | 1-1115  |
| HCNAQ26 | 1230 | 685199 | AC012404 | 5040 | 1-1115  |
| HCNAP29 | 1231 | 855685 | AC012320 | 5041 | 1-455   |
| HCNAP29 | 1231 | 855685 | AC004382 | 5042 | 1-455   |
| HCNAL30 | 1232 | 522672 | AC004519 | 5043 | 1-120   |
| HCNAK11 | 1233 | 967945 | AC003991 | 5044 | 1-977   |
| HCNAA41 | 1234 | 791545 | AF231129 | 5045 | 1-970   |
| HCNAA41 | 1234 | 791545 | AC026458 | 5046 | 1-1382  |
| HCNAA41 | 1234 | 791545 | AC069047 | 5047 | 1-236<br>552-842<br>1745-3603<br>3697-3797<br>3977-4311<br>4540-5215<br>5349-5754<br>5897-6069<br>6293-6847<br>7430-7862<br>8779-9218 |
| HCNAA41 | 1234 | 791545 | AC022674 | 5048 | 1-196<br>398-598<br>605-680<br>811-1547<br>1568-2200<br>2208-3590   |

|         |      |        |          |      |  |
|---------|------|--------|----------|------|--|
|         |      |        |          |      | 4511-5262<br>5305-5455<br>5885-5993<br>6125-6553   |
| HCNAA41 | 1234 | 791545 | AC026458 | 5049 | 1-191  |
| HCNAA41 | 1234 | 791545 | AC069047 | 5050 | 1-224  |
| HCNAA41 | 1234 | 791545 | AC026458 | 5051 | 1-467  |
| HCNAA41 | 1234 | 791545 | AC069047 | 5052 | 1-276<br>291-329<br>335-615  |
| HCNAA41 | 1234 | 791545 | AC022674 | 5053 | 1-225  |
| HCLHE01 | 1235 | 914341 | AC015936 | 5054 | 1-867<br>941-1038<br>1445-2109   |
| HCLHE01 | 1235 | 914341 | AC015936 | 5055 | 1-2147   |
| HCIAC12 | 1237 | 970750 | AL365321 | 5056 | 1-300<br>888-1011  |
| HCIAC12 | 1237 | 970750 | AL137856 | 5057 | 1-300<br>888-1011  |
| HCIAC12 | 1237 | 970750 | AL137856 | 5058 | 1-129  |
| HASMC23 | 1238 | 675527 | AC078779 | 5059 | 1-437  |
| HASMC23 | 1238 | 675527 | AC007879 | 5060 | 1-437  |
| HASMC23 | 1238 | 675527 | AC078779 | 5061 | 1-678  |
| HASMC23 | 1238 | 675527 | AC007879 | 5062 | 1-678  |
| HAQNB68 | 1240 | 752573 | AL355527 | 5063 | 1-732<br>915-1304  |
| HAQNB68 | 1240 | 752573 | AC031978 | 5064 | 1-732<br>915-1304  |
| HAQNB68 | 1240 | 752573 | AL355527 | 5065 | 1-195<br>4293-4519<br>5143-5283<br>5581-6183<br>6220-6565  |
| HAQNB68 | 1240 | 752573 | AL355527 | 5066 | 1-525  |
| HAQNB68 | 1240 | 752573 | AC031978 | 5067 | 1-509<br>787-1159<br>1256-1670<br>2179-2779<br>3028-3227<br>3307-3816<br>4090-4193<br>4926-5105<br>5203-5628<br>6078-7654<br>7723-8191<br>8290-9353<br>9574-9769 |

|         |      |        |          |      |  |
|---------|------|--------|----------|------|--|
|         |      |        |          |      | 13869-14095<br>14719-14859<br>15157-15759<br>15796-16141   |
| HAQNB68 | 1240 | 752573 | AC031978 | 5068 | 1-525  |
| HAQMP04 | 1241 | 925685 | AC013399 | 5069 | 1-745  |
| HAQMP04 | 1241 | 925685 | AC013399 | 5070 | 1-511  |
| HAQMK53 | 1242 | 727708 | AC022702 | 5071 | 1-220<br>2365-2620<br>2992-3310<br>3432-3987<br>4545-5235<br>5266-5325<br>5814-6468<br>6801-6965<br>7327-7763<br>7979-8172             |
| HAQMK53 | 1242 | 727708 | AC025796 | 5072 | 1-556  |
| HAQMK53 | 1242 | 727708 | AL133216 | 5073 | 1-306<br>1488-1890<br>2450-2722<br>3082-3400<br>3526-4081<br>4304-5314   |
| HAQMK53 | 1242 | 727708 | AC006457 | 5074 | 1-513  |
| HAQMK53 | 1242 | 727708 | AF198096 | 5075 | 1-308<br>1490-1896<br>2457-2728<br>2816-3407<br>3532-4087<br>4313-5008<br>5584-6209  |
| HAQMK53 | 1242 | 727708 | AC022702 | 5076 | 1-316  |
| HAQMK53 | 1242 | 727708 | AC025796 | 5077 | 1-592  |
| HAQMK53 | 1242 | 727708 | AC025796 | 5078 | 1-694  |
| HAQMK53 | 1242 | 727708 | AL133216 | 5079 | 1-750  |
| HAQMK53 | 1242 | 727708 | AL133216 | 5080 | 1-138<br>734-1117<br>1716-2301<br>2496-3003<br>3142-3588<br>5476-6185<br>6679-7322<br>7428-7952<br>8163-8628<br>9071-9154<br>9380-9538 |

|         |      |        |          |      |   |
|---------|------|--------|----------|------|---|
|         |      |        |          |      | 10422-10640<br>10673-10765<br>10780-10828<br>11018-11735<br>12735-13548<br>13651-14193<br>14663-14949<br>15056-15454<br>17688-18060<br>19315-19659        |
| HAQMK53 | 1242 | 727708 | AC006457 | 5081 | 1-319   |
| HAQMK53 | 1242 | 727708 | AF198096 | 5082 | 1-2408  |
| HAQMK53 | 1242 | 727708 | AF198096 | 5083 | 1-373   |
| HALSD90 | 1244 | 500844 | AL358788 | 5084 | 1-326   |
| HALSD90 | 1244 | 500844 | AL035703 | 5085 | 1-326   |
| HALSD90 | 1244 | 500844 | AL358788 | 5086 | 1-303   |
| HALSD90 | 1244 | 500844 | AL358788 | 5087 | 1-169   |
| HALSD90 | 1244 | 500844 | AL035703 | 5088 | 1-169   |
| HALSD90 | 1244 | 500844 | AL035703 | 5089 | 1-281   |
| HALSD51 | 1245 | 500852 | AL358785 | 5090 | 1-257<br>287-692<br>1417-1580<br>2345-2567<br>3689-4208<br>5913-6558<br>6925-7555<br>7993-8428<br>9734-10170<br>10340-10967<br>10992-11330<br>12284-14337 |
| HALSD51 | 1245 | 500852 | AC005678 | 5091 | 1-257<br>287-692<br>1417-1580<br>2345-2567<br>3689-4208<br>5913-6558<br>6925-7555<br>7993-8428<br>9734-10170<br>10340-10967<br>10992-11330<br>12284-13526 |
| HALSD51 | 1245 | 500852 | AC005678 | 5092 | 1-781   |
| HALSD51 | 1245 | 500852 | AL358785 | 5093 | 1-102   |
| HALSD34 | 1246 | 509765 | AC025648 | 5094 | 1-360   |
| HALSD34 | 1246 | 509765 | AC025062 | 5095 | 1-360   |

|         |      |        |          |      |   |
|---------|------|--------|----------|------|---|
| HALSD34 | 1246 | 509765 | AC025648 | 5096 | 1-353   |
| HALSD03 | 1247 | 960910 | AC025389 | 5097 | 1-382   |
| HALSD03 | 1247 | 960910 | AC025389 | 5098 | 1-449   |
| HALSD03 | 1247 | 960910 | AC025389 | 5099 | 1-387<br>1195-2050<br>2234-2844   |
| HALSC37 | 1248 | 705894 | AL359926 | 5100 | 1-303   |
| HALSC37 | 1248 | 705894 | AL359175 | 5101 | 1-303   |
| HALSC37 | 1248 | 705894 | AL359926 | 5102 | 1-337   |
| HALSC18 | 1249 | 667044 | AC068037 | 5103 | 1-346   |
| HALSC18 | 1249 | 667044 | AC068037 | 5104 | 1-492   |
| HAJRA03 | 1250 | 923504 | AC025515 | 5105 | 1-988   |
| HAJRA03 | 1250 | 923504 | AC025515 | 5106 | 1-1719  |
| H2MBY07 | 1252 | 953691 | AC018881 | 5107 | 1-1603  |
| H2MBY07 | 1252 | 953691 | AC018881 | 5108 | 1-225   |
| H2LAM15 | 1258 | 767606 | AC005971 | 5109 | 1-384<br>1607-2194<br>2501-2679<br>2714-3008<br>3294-5645<br>5706-5867<br>7869-8294<br>8698-8815<br>9677-9738<br>10469-10894<br>16079-16366<br>18971-19267<br>19303-19634<br>22325-22853<br>23664-23983<br>24003-24401<br>24470-24690<br>25545-26062<br>26253-27613<br>29664-29801<br>35223-36709 |
| H2LAM15 | 1258 | 767606 | AL356460 | 5110 | 1-296<br>1519-2272<br>2413-2591<br>2626-2920<br>3206-5559<br>5620-5781<br>7784-8208<br>8613-8730<br>9592-9653<br>10384-10809<br>13353-13493   |

|         |      |        |          |      |   |
|---------|------|--------|----------|------|---|
|         |      |        |          |      | 16165-16265<br>18887-19122<br>19219-19549<br>22239-22666<br>22710-23025<br>23112-23564<br>23898-24217<br>24237-24635<br>24704-24924<br>25767-26284<br>26475-27836<br>30276-30380<br>33861-34003<br>35218-35346<br>35446-36933 |
| H2LAM15 | 1258 | 767606 | AC005971 | 5111 | 1-89  |
| H2LAM15 | 1258 | 767606 | AL356460 | 5112 | 1-383   |
| H2CBP41 | 1259 | 923006 | AC027116 | 5113 | 1-417<br>1542-1883<br>2547-2644<br>3234-3317<br>4045-4387<br>4561-4942<br>5029-5287<br>6230-6850<br>6936-7598<br>7713-8015<br>8248-8896   |
| H2CBP41 | 1259 | 923006 | AC021329 | 5114 | 1-417<br>1542-1883<br>2547-2644<br>3234-3317<br>4045-4387<br>4561-4942<br>5029-5287<br>6230-6850<br>6936-7597<br>7712-8014<br>8247-8895   |
| H2CBP41 | 1259 | 923006 | AC027116 | 5115 | 1-5853<br>5877-7569   |
| H2CBP41 | 1259 | 923006 | AC021329 | 5116 | 1-5853<br>5877-7569   |

[073] Table 1B summarizes additional polynucleotides encompassed by the invention (including cDNA clones related to the sequences (Clone ID NO:Z), contig sequences

(contig identifier (Contig ID:) contig nucleotide sequence identifiers (SEQ ID NO:X)), and genomic sequences (SEQ ID NO:B). The first column provides a unique clone identifier, "Clone ID NO:Z", for a cDNA clone related to each contig sequence. The second column provides the sequence identifier, "SEQ ID NO:X", for each contig sequence. The third column provides a unique contig identifier, "Contig ID:" for each contig sequence. The fourth column, provides a BAC identifier "BAC ID NO:A" for the BAC clone referenced in the corresponding row of the table. The fifth column provides the nucleotide sequence identifier, "SEQ ID NO:B" for a fragment of the BAC clone identified in column four of the corresponding row of the table. The sixth column, "Exon From-To", provides the location (i.e., nucleotide position numbers) within the polynucleotide sequence of SEQ ID NO:B which delineate certain polynucleotides of the invention that are also exemplary members of polynucleotide sequences that encode polypeptides of the invention (e.g., polypeptides containing amino acid sequences encoded by the polynucleotide sequences delineated in column six, and fragments and variants thereof).

**TABLE 2**

| Clone ID<br>NO:Z | Contig<br>ID: | SEQ<br>ID<br>NO:X | Analysis<br>Method | PFam/NR Description   | PFam/NR Accession<br>Number  | Score/<br>Percent<br>Identity | NT<br>From             | NT<br>To                |
|------------------|---------------|-------------------|--------------------|---|------------------------------|-------------------------------|------------------------|-------------------------|
| H2CBG54          | 893910        | 11                | blastx.2           | (AK000657) unnamed<br>protein product [Homo<br>sapiens]     | dbj BAA91310.1               | 96%                           | 54                     | 593                     |
| HALSK15          | 501003        | 18                | blastx.2           | sodium phosphate<br>transporter [Homo sapiens]              | gb AAB53422.1                | 100%                          | 15                     | 131                     |
| HBAAE56          | 953244        | 22                | HMMER<br>1.8       | PFAM: Core histones<br>H2A, H2B, H3 and H4                  | PF00125                      | 11.56                         | 94                     | 159                     |
| HCNDL91          | 832209        | 50                | blastx.2           | transformation-related<br>protein [Homo sapiens]            | gb AAA36776.1                | 60%<br>50%<br>33%             | 341<br>121<br>142      | 222<br>86<br>80         |
| HCNUA60          | 695786        | 57                | HMMER<br>2.1.1     | PFAM: Uncharacterized<br>protein family                     | PF01027                      | 24.9                          | 132                    | 224                     |
| HCRM69           | 877118        | 65                | blastx.2           | (AF151877) CGI-119<br>protein [Homo sapiens]                | gb AAD34114.1 AF15<br>1877 1 | 100%                          | 135                    | 206                     |
|                  |               |                   | HMMER<br>2.1.1     | PFAM: N2,N2-<br>dimethylguanosine tRNA<br>methyltransferase | PF02005                      | 44.3                          | 194                    | 292                     |
| HCRMT41          | 974324        | 66                | blastx.2           | (AC005546) R29425_1<br>[Homo sapiens]                       | gb AAC33150.1                | 96%<br>77%<br>80%<br>100%     | 194<br>274<br>58<br>32 | 292<br>381<br>120<br>73 |
|                  |               |                   | blastx.2           | similar to Na+/H+<br>antiporter [Bacillus<br>subtilis]      | emb CAB14288.1               | 28%                           | 133                    | 486                     |
|                  |               |                   | blastx.2           | [dl 970227] Weak splice                                     | emb CAB03422.1               | 29%                           | 93                     | 563                     |



|         |        |     |  |                         |   |                                     |                          |                          |                          |
|---------|--------|-----|--|-------------------------|---|-------------------------------------|--------------------------|--------------------------|--------------------------|
| HCROE42 | 950701 | 72  |  | blastx.2                | needed to incorporate EST & BlastX 1 1 1 cDN (AF184344) DNA polymerase accessory subunit precursor [Homo sapiens] | gb AAD56542.1 AF184344_1            | 99%<br>77%               | 3<br>679                 | 683<br>840               |
| HCRPT92 | 931152 | 77  |  | HMMER 2.1.1<br>blastx.2 | PFAM: Cytosol aminopeptidase family (AF218811) putative cytoplasmic aminopeptidase 1                              | PF00883<br>gb AAF32328.1 AF218811_1 | 261<br>74%               | 14<br>5                  | 676<br>727               |
| HCRQG35 | 954968 | 80  |  | blastx.2                | unnamed protein product [unidentified]  | emb CAB69195.1                      | 81%                      | 11                       | 91                       |
| HDRMA28 | 841936 | 83  |  | blastx.2                | (AK002129) unnamed protein product [Homo sapiens]   | dbj BAA92096.1                      | 67%                      | 152                      | 280                      |
| HFLQA82 | 757380 | 89  |  | HMMER 1.8               | PFAM: C2 domain   | PF00168                             | 3.08                     | 52                       | 90                       |
| HFLSH67 | 968639 | 92  |  | blastx.2                | (AF010144) neuronal thread protein AD7c-NTP [Homo sapiens]  | gb AAC08737.1                       | 68%<br>67%<br>56%<br>46% | 174<br>176<br>291<br>270 | 269<br>268<br>359<br>359 |
| HFLSK11 | 964908 | 95  |  | HMMER 1.8               | PFAM: Bacterial mutT protein  | PF00293                             | 3.01                     | 159                      | 197                      |
| HFLUF43 | 928026 | 98  |  | blastx.2                | (AF090894) PRO0113 [Homo sapiens]   | gb AAF24018.1 AF090894_1            | 67%                      | 853                      | 716                      |
| HFLVE61 | 539872 | 101 |  | blastx.2                | lambda HuHITI-13 [Homo sapiens]   | emb CAA32821.1                      | 99%<br>100%              | 1<br>320                 | 306<br>343               |

|         |        |     |                         |   |                           |                            |                        |                          |
|---------|--------|-----|-------------------------|---|---------------------------|----------------------------|------------------------|--------------------------|
| HFLV115 | 921860 | 103 | blastx.2                | 5-methyltetrahydrofolate-homocysteine transferase (AA 1-1200) 1       | emb CAA34601.1            | 97%                        | 320                    | 9                        |
| HFVHF81 | 929124 | 111 | HMMER 1.8               | PFAM: Ubiquitin carboxyl-terminal hydrolases family 2                 | PF00442                   | 82%<br>36%                 | 379<br>441             | 329<br>319               |
| HGBAU93 | 625250 | 134 | blastx.2                | (AL117458) hypothetical protein [Homo sapiens]                        | emb CAB55936.1            | 50%<br>55%                 | 1<br>207               | 165<br>287               |
| HGBBO62 | 509691 | 137 | blastx.2                | (AF192522) Niemann-Pick C3 protein; NPC3 [Homo sapiens]               | gb AAF20396.1 AF192522_1  | 100%                       | 3                      | 125                      |
| HGBDB04 | 961510 | 141 | blastx.2                | (AF151072) HSPC238 [Homo sapiens]                                     | gb AAF36158.1 AF151072_1  | 97%<br>83%<br>39%          | 38<br>246<br>283       | 256<br>338<br>360        |
| HGBDG69 | 578390 | 148 | blastx.2                | (AL137370) hypothetical protein [Homo sapiens]                        | emb CAB70714.1            | 70%                        | 28                     | 282                      |
| HGBDY59 | 815818 | 158 | HMMER 2.1.1<br>blastx.2 | PFAM: Calpain family cysteine protease<br>calpain [Rattus norvegicus] | PF00648<br>dbj BAA03371.1 | 86.3%<br>87%<br>87%        | 9<br>176<br>3          | 167<br>454<br>167        |
| HGBGO22 | 558830 | 163 | HMMER 1.8<br>blastx.2   | PFAM: Annexins<br>intestine-specific annexin [Homo sapiens]           | PF00191<br>emb CAA77578.1 | 35.5%<br>51%<br>40%<br>48% | 114<br>25<br>84<br>143 | 272<br>291<br>356<br>352 |
| HGOCB25 | 506771 | 174 | blastx.2                | (AF161356) HSPC093 [Homo sapiens]                                     | gb AAF28916.1 AF161356_1  | 53%                        | 210                    | 1                        |
| HISCN24 | 764837 | 199 | blastx.2                | (AK001360) unnamed  | dbj BAA91648.1            | 86%                        | 175                    | 312                      |

|         |        |     |                            |  |                          |                           |                        |                          |
|---------|--------|-----|----------------------------|--|--------------------------|---------------------------|------------------------|--------------------------|
| HLSDO59 | 857479 | 203 | blastx.2                   | protein product [Homo sapiens]<br>(AF113685) PRO0974<br>[Homo sapiens] | gb AAF29584.1 AF113685_1 | 52%<br>58%                | 331<br>105             | 119<br>55                |
| HLDBJ86 | 882365 | 217 | blastx.2                   | (AF097518) liver-specific transporter [Homo sapiens]                   | gb AAD37091.1 AF097518_1 | 74%<br>100%               | 35<br>378              | 334<br>431               |
| HLDCI35 | 831356 | 221 | HMMER<br>1.8               | PFAM: Helicases conserved C-terminal domain                            | PF00271                  | 6.01                      | 288                    | 374                      |
| HLDCU27 | 950724 | 222 | blastx.2                   | (AF209192) Apobec-1 complementation factor [Homo 1]                    | gb AAF34824.1 AF209192_1 | 94%                       | 177                    | 725                      |
| HLDDH01 | 926360 | 223 | HMMER<br>2.1.1<br>blastx.2 | PFAM: Collagen triple helix repeat (20 copies)                         | PF01391                  | 39.9                      | 107                    | 250                      |
|         |        |     |                            | GDQGE (5x) [Paramecium bursaria Chlorella virus 1]                     | gb AAC97040.1            | 56%<br>37%                | 107<br>48              | 202<br>110               |
|         |        |     | HMMER<br>2.1.1<br>blastx.2 | PFAM: tRNA synthetases class II (D, K and N)                           | PF00152                  | 53.1                      | 15                     | 140                      |
|         |        |     |                            | (AE001123) asparaginyl-tRNA synthetase (asnS) [Borrelia burgdorferi]   | gb AAC66501.1            | 38%                       | 3                      | 323                      |
| HLDDI91 | 790003 | 224 | HMMER<br>1.8               | PFAM: RNA recognition motif (aka RRM, RBD, or RNP domain)              | PF00076                  | 60.16                     | 393                    | 590                      |
|         |        |     | blastx.2                   | (AF209192) Apobec-1 complementation factor [Homo 1]                    | gb AAF34824.1 AF209192_1 | 100%<br>96%<br>97%<br>16% | 2<br>351<br>244<br>104 | 244<br>602<br>348<br>262 |

|         |        |     |             |  |                          |                     |                 |                   |
|---------|--------|-----|-------------|--|--------------------------|---------------------|-----------------|-------------------|
| HLDNJ57 | 733903 | 227 | blastx.2    | (AK001848) unnamed protein product [Homo sapiens]                                | dbj BAA91940.1           | 68%                 | 61              | 399               |
| HLDNU53 | 883158 | 228 | blastx.2    | (AF097518) liver-specific transporter [Homo sapiens]                             | gb AAD37091.1 AF097518_1 | 71%                 | 3               | 182               |
| HLDOA63 | 949166 | 229 | HMMER 2.1.1 | PFAM: NTR/C345C module   | PF01759                  | 34.1                | 144             | 323               |
|         |        |     | blastx.2    | complement C3 protein (GPC3) precursor [Cavia porcellus]                         | gb AAA37038.1            | 35%                 | 72              | 449               |
| HLDON90 | 788891 | 232 | HMMER 1.8   | PFAM: Laminin B (Domain IV)  | PF00052                  | 1.99                | 77              | 100               |
| HLDOU12 | 857106 | 234 | blastx.2    | (AF202889) regeneration associated protein 3 [Homo sapiens]                      | gb AAF25661.1 AF202889_1 | 100%                | 1               | 99                |
| HLDQC62 | 923559 | 239 | blastx.2    | (AF091457) zinc finger protein RIN ZF [Rattus norvegicus]                        | gb AAD22522.1 AF091457_1 | 50%<br>51%          | 1302<br>1036    | 1039<br>941       |
| HLDRD54 | 727954 | 243 | blastx.2    | (AF090944) PRO0663 [Homo sapiens]  | gb AAF24056.1 AF090944_1 | 62%                 | 121             | 240               |
| HLDRQ82 | 837031 | 248 | blastx.2    | (AF064255) very long-chain acyl-CoA synthetase homolog 2; VLCS-H2 [Homo sapiens] | gb AAD29444.1 AF064255_1 | 100%<br>87%<br>100% | 325<br>143<br>3 | 582<br>340<br>140 |
| HLIBJ13 | 910830 | 251 | HMMER 2.1.1 | PFAM: Fibrinogen beta and gamma chains, C-terminal globular domain               | PF00147                  | 153.7               | 72              | 389               |
|         |        |     | blastx.2    | (AF152562) angiopoietin-   | gb AAD34156.1 AF15       | 90%                 | 60              | 422               |

|         |        |     |                |  |                          |             |            |            |
|---------|--------|-----|----------------|--|--------------------------|-------------|------------|------------|
| HLICR73 | 837030 | 255 | HMMER<br>1.8   | related protein 3 [Homo sapiens]<br>PFAM: AMP-binding enzymes                    | 2562_1<br>PF00501        | 20.33       | 19         | 324        |
|         |        |     | blastx.2       | (AF064255) very long-chain acyl-CoA synthetase homolog 2; VLCS-H2 [Homo sapiens] | gb AAD29444.1 AF064255_1 | 99%<br>100% | 1<br>450   | 441<br>497 |
| HLQAL33 | 702755 | 260 | blastx.2       | hypothetical L1 protein (third intron of gene TS) - human                        | pir JU0033 JU0033        | 38%         | 347        | 3          |
| HLQAZ69 | 960046 | 262 | blastx.2       | (AF139185) myomegalin [Rattus norvegicus]  | gb AAD29427.1            | 77%         | 31         | 201        |
| HLQBF72 | 608371 | 263 | HMMER<br>2.1.1 | PFAM: HECT-domain (ubiquitin-transferase).                                       | PF00632                  | 32.6        | 189        | 284        |
|         |        |     | blastx.2       | (AF199364) E3 ubiquitin ligase SMURF1 [Homo sapiens]                             | gb AAF08298.2            | 96%         | 189        | 284        |
| HLQBI21 | 529342 | 265 | blastx.2       | (AL121739) hypothetical protein [Homo sapiens]                                   | emb CAB57329.1           | 97%         | 10         | 120        |
| HLQDP11 | 966775 | 274 | blastx.2       | (AK000496) unnamed protein product [Homo sapiens]                                | dbj BAA91205.1           | 55%         | 53         | 292        |
| HLQDY10 | 856755 | 276 | blastx.2       | alternatively spliced product using exon 13A [Homo sapiens]                      | gb AAB49034.1            | 75%<br>85%  | 379<br>459 | 284<br>439 |
| HLQED11 | 966015 | 277 | blastx.2       | (AK000385) unnamed protein product [Homo sapiens]                                | dbj BAA91131.1           | 63%<br>82%  | 21<br>91   | 86<br>141  |

|         |        |     |                            |   |                              |                          |                         |                          |
|---------|--------|-----|----------------------------|---|------------------------------|--------------------------|-------------------------|--------------------------|
| HLQFO69 | 933385 | 282 | HMMER<br>2.1.1<br>blastx.2 | sapiens]<br>PFAM: HECT-domain<br>(ubiquitin-transferase).<br>hypothetical protein 2 -<br>human (fragment) | PF00632                      | 87.8                     | 245                     | 553                      |
| HLQK74  | 856736 | 283 | blastx.2                   | CRP2 (cysteine-rich<br>protein 2) [Rattus<br>norvegicus]  | dbj BAA04464.1               | 78%<br>70%               | 1<br>1                  | 150<br>150               |
| HLQGN56 | 842004 | 284 | blastx.2                   | unknown [Homo sapiens]  | gb AAB50206.1                | 80%<br>51%               | 506<br>426              | 414<br>271               |
| HNAAE73 | 922929 | 288 | blastx.2                   | (AF190862) ADP-<br>ribosylation factor binding<br>protein GGA1 [Homo<br>sapiens]                          | gb AAF05707.1 AF19<br>0862_1 | 81%<br>100%              | 17<br>198               | 193<br>233               |
| HNJBA08 | 955993 | 290 | HMMER<br>1.8<br>blastx.2   | PFAM: HMG (high<br>mobility group) box<br>(AF081497) tumor-related<br>protein [Homo sapiens]              | PF00505                      | 4.88                     | 482                     | 547                      |
| HNJBL71 | 939266 | 293 | blastx.2                   | PFAM: LBP / BPI / CETP<br>family  | gb AAD55748.1 AF08<br>1497_1 | 98%                      | 1                       | 192                      |
| HNJBN94 | 948996 | 294 | HMMER<br>2.1.1<br>blastx.2 | potential ligand-binding<br>protein [Rattus rattus]   | PF01273                      | 37.8                     | 34                      | 636                      |
| HNJCD23 | 961494 | 296 | HMMER<br>1.8<br>blastx.2   | PFAM: Protamine P1  | emb CAA43067.1               | 28%                      | 103                     | 621                      |
| HNJEA92 | 955842 | 298 | blastx.2                   | unknown [Mus musculus]  | PF00260                      | 45.65                    | 89                      | 223                      |
| HNKBB44 | 955843 | 301 | blastx.2                   | unknown [Mus musculus]  | gb AAB63256.1                | 75%<br>55%<br>60%<br>68% | 349<br>70<br>136<br>834 | 837<br>198<br>210<br>274 |

|         |        |      |             |   |                          |                          |                           |                           |
|---------|--------|------|-------------|---|--------------------------|--------------------------|---------------------------|---------------------------|
| HNKBS78 | 955565 | 303  | blastx.2    | unknown [Mus musculus]  | gb AAB63256.1            | 74%                      | 700                       | 227                       |
| HROAL51 | 526487 | 313  | blastx.2    | zinc finger protein [Homo sapiens]  | gb AAA59469.1            | 77%                      | 125                       | 45                        |
| HROBC76 | 880935 | 317  | HMMER 2.1.1 | PFAM: Ammonium Transporter Family   | PF00909                  | 44%                      | 221                       | 150                       |
|         |        |      | blastx.2    | (AF081497) tumor-related protein [Homo sapiens]   | gb AAD55748.1 AF081497.1 | 38.7                     | 3                         | 119                       |
| HROBQ03 | 867044 | 321  | blastx.2    | X-linked retinopathy protein [C-terminal, clone XEH.8c] [human, Peptide Partial, 100 aa] [Homo sapiens] | gb AAB26149.1            | 52%<br>69%               | 276<br>349                | 353<br>381                |
| HSICR69 | 531061 | 340  | HMMER 1.8   | PFAM: Phorbol esters / diacylglycerol binding domain  | PF00130                  | 3.1                      | 190                       | 213                       |
| HSICX21 | 531267 | 344  | HMMER 1.8   | PFAM: Zinc-binding metalloprotease domain   | PF00099                  | 3.8                      | 307                       | 336                       |
| HSIDW39 | 775139 | 361  | HMMER 2.1.1 | PFAM: Glycosyl hydrolase family 1   | PF00232                  | 134                      | 28                        | 372                       |
|         |        |      | blastx.2    | cytosolic beta-glucosidase [Cavia porcellus]  | gb AAB41058.1            | 84%                      | 1                         | 363                       |
| HSIDW39 | 830774 | 1261 | HMMER 2.1.1 | PFAM: Glycosyl hydrolase family 1   | PF00232                  | 155.5                    | 42                        | 419                       |
| HSIEE78 | 904664 | 364  | blastx.2    | epidermal growth factor receptor kinase substrate [Homo sapiens]  | gb AAA62280.1            | 36%<br>62%<br>35%<br>40% | 214<br>1138<br>768<br>774 | 657<br>1185<br>869<br>848 |
| HSIEO17 | 922867 | 367  | HMMER       | PFAM: TPR Domain  | PF00515                  | 10.76                    | 376                       | 417                       |

|         |        |     |  | 1.8                     |  |                               |                                    |                                  |                                    |
|---------|--------|-----|--|-------------------------|--|-------------------------------|------------------------------------|----------------------------------|------------------------------------|
|         |        |     |  | blastx.2                | (AL137520) hypothetical protein [Homo sapiens]                                   | emb CAB70786.1                | 90%                                | 1                                | 939                                |
| HSIFE08 | 839907 | 372 |  | blastx.2                | Bkm-like sex-determining region hypothetical protein CS314 - 1                   | pir B21124 B21124             | 42%                                | 170                              | 352                                |
| HSIFH48 | 721310 | 376 |  | blastx.2                | ASPARTOACYLASE (EC 3.5.1.15)<br>(AMINOACYLASE-2)<br>(ACY-2).                     | sp P46446 ACY2_BOVIN          | 38%<br>35%                         | 1<br>284                         | 195<br>445                         |
| HSIFS23 | 919109 | 380 |  | blastx.2                | myosin VIIA [Homo sapiens]   | gb AAB03679.1                 | 54%                                | 6                                | 266                                |
| HSOBF65 | 747484 | 407 |  | blastx.2                | alternatively spliced product using exon 13A [Homo sapiens]                      | gb AAB49034.1                 | 66%<br>61%                         | 310<br>353                       | 158<br>300                         |
| HSODZ10 | 963671 | 419 |  | blastx.2                | (AF090942) PRO0657 [Homo sapiens]  | gb AAF24054.1 AF090942.1      | 49%                                | 159                              | 329                                |
| HSPAQ91 | 789887 | 427 |  | blastx.2                | (AK000352) unnamed protein product [Homo sapiens]                                | dbj BAA91105.1                | 98%                                | 136                              | 315                                |
| HSPME73 | 915722 | 431 |  | HMMER 2.1.1<br>blastx.2 | PFAM: DNA polymerase X family<br>(AJ131890) DNA polymerase lambda [Homo sapiens] | PF00966<br><br>emb CAB65074.1 | 68<br><br>90%<br>94%<br>97%<br>75% | 433<br><br>400<br>33<br>267<br>2 | 747<br><br>798<br>266<br>398<br>73 |
| HTPDJ94 | 669158 | 456 |  | blastx.2                | U2 snRNP auxiliary factor  | gb AAB17271.1                 | 69%                                | 213                              | 311                                |



|         |        |     |                           |   |                           |                   |                   |                   |
|---------|--------|-----|---------------------------|---|---------------------------|-------------------|-------------------|-------------------|
|         |        |     | [Drosophila melanogaster] |   |                           | 68%               | 143               | 208               |
|         |        |     |                           |   |                           | 92%               | 58                | 99                |
|         |        |     |                           |   |                           | 91%               | 3                 | 38                |
|         |        |     |                           |   |                           | 75%               | 35                | 58                |
| HTPDV73 | 912947 | 462 | HMMER<br>1.8              | PFAM: Ras family<br>(contains ATP/GTP binding P-loop)             | PF00071                   | 205.32            | 306               | 740               |
|         |        |     | blastx.2                  | (AL049685) hypothetical protein [Homo sapiens]                    | emb CAB41256.1            | 97%               | 312               | 746               |
| HTPDZ94 | 660751 | 465 | blastx.2                  | ORF 3 [Homo sapiens]  | gb AAA58464.1             | 53%<br>62%<br>46% | 262<br>342<br>93  | 101<br>271<br>4   |
| HTPFQ07 | 869785 | 474 | blastx.2                  | human type 3 inositol 1,4,5-trisphosphate receptor [Homo sapiens] | gb AAC50064.1             | 90%               | 261               | 380               |
| HTPFZ03 | 922755 | 481 | blastx.2                  | (AF118086) PRO1992 [Homo sapiens]                                 | gb AAF22030.1 AF118094_25 | 73%               | 18                | 116               |
| HTPGD19 | 869842 | 482 | blastx.2                  | (AL049847) hypothetical protein [Homo sapiens]                    | emb CAB42851.1            | 87%<br>92%        | 365<br>294        | 535<br>368        |
| HTPGW12 | 969522 | 489 | HMMER<br>2.1.1            | PFAM: SCAN domain   | PF02023                   | 117.3             | 4                 | 192               |
|         |        |     | blastx.2                  | serum response element-binding protein SRE-ZBP-human (fragment)   | pir A44391 A44391         | 72%<br>40%<br>53% | 4<br>226<br>228   | 180<br>282<br>266 |
| HTPHK06 | 975310 | 494 | blastx.2                  | (AF010144) neuronal thread protein AD7c-NTP [Homo sapiens]        | gb AAC08737.1             | 81%<br>52%<br>60% | 288<br>300<br>383 | 383<br>464<br>472 |
| HTPIC25 | 975319 | 499 | blastx.2                  | (AK000546) unnamed  | dbj BAA91245.1            | 32%               | 28                | 429               |

|         |        |     |                |   |                          |       |      |      |
|---------|--------|-----|----------------|---|--------------------------|-------|------|------|
| HTPIE48 | 911422 | 500 | HMMER<br>1.8   | protein product [Homo sapiens]<br>PFAM: Src homology domain 3     | PF00018                  | 3.78  | 2    | 58   |
|         |        |     | blastx.2       | (AC005954) ZO-3 [Homo sapiens]                                    | gb AAC72274.1            | 80%   | 2    | 313  |
| HUFAA81 | 777951 | 501 | blastx.2       | unknown [Homo sapiens]  | gb AAC50940.1            | 58%   | 155  | 358  |
| HUFAC65 | 750264 | 502 | blastx.2       | (AL133640) hypothetical protein [Homo sapiens]                    | emb CAB63761.1           | 83%   | 3    | 302  |
| HUFAP02 | 919805 | 507 | blastx.2       | biliverdin-IX beta reductase I [Homo sapiens]                     | dbj BAA06874.1           | 50%   | 293  | 379  |
| HUFAU25 | 678024 | 508 | HMMER<br>2.1.1 | PFAM: RNA polymerase beta subunit                                 | PF00562                  | 112.6 | 1    | 141  |
|         |        |     | blastx.2       | (AK001161) unnamed protein product [Homo sapiens]                 | dbj BAA91527.1           | 79%   | 1    | 309  |
| HUFBN27 | 868997 | 510 | blastx.2       | initiation factor 2 [Homo sapiens]                                | gb AAA67038.1            | 99%   | 81   | 401  |
| HUFDB55 | 950430 | 515 | HMMER<br>2.1.1 | PFAM: SEA domain  | PF01390                  | 22.9  | 1485 | 1138 |
|         |        |     | blastx.2       | (AF147790) transmembrane mucin 12 [Homo sapiens]                  | gb AAD55678.1 AF147790_1 | 84%   | 2133 | 553  |
| HUFGH78 | 659722 | 516 | blastx.2       | (AL035413) dJ657E11.3 (aldo-keto reductase family 7, member A3 1) | emb CAB72322.1           | 41%   | 2058 | 1708 |
|         |        |     |                |   |                          | 39%   | 2055 | 1714 |
|         |        |     |                |   |                          | 87%   | 47   | 313  |
|         |        |     |                |   |                          | 69%   | 316  | 480  |
|         |        |     |                |   |                          | 100%  | 412  | 483  |
| HUVDJ10 | 886207 | 517 | blastx.2       | (AF010144) neuronal thread protein AD7c-NTP                       | gb AAC08737.1            | 65%   | 1093 | 854  |
|         |        |     |                |   |                          | 66%   | 1077 | 853  |

|         |        |     |                |   |                              |  |  |       |      |      |
|---------|--------|-----|----------------|---|------------------------------|--|--|-------|------|------|
|         |        |     |                | [Homo sapiens]                              |                              |  |  | 53%   | 1081 | 797  |
|         |        |     |                |   |                              |  |  | 56%   | 1897 | 1742 |
|         |        |     |                |   |                              |  |  | 52%   | 1923 | 1756 |
|         |        |     |                |   |                              |  |  | 54%   | 1005 | 868  |
|         |        |     |                |   |                              |  |  | 51%   | 1854 | 1726 |
|         |        |     |                |   |                              |  |  | 59%   | 990  | 910  |
|         |        |     |                |   |                              |  |  | 69%   | 896  | 828  |
|         |        |     |                |   |                              |  |  | 61%   | 1988 | 1926 |
|         |        |     |                |   |                              |  |  | 54%   | 1984 | 1892 |
|         |        |     |                |   |                              |  |  | 40%   | 1902 | 1801 |
|         |        |     |                |   |                              |  |  | 41%   | 1033 | 914  |
|         |        |     |                |   |                              |  |  | 57%   | 1818 | 1741 |
|         |        |     |                |   |                              |  |  | 44%   | 1798 | 1712 |
|         |        |     |                |   |                              |  |  | 61%   | 945  | 892  |
|         |        |     |                |   |                              |  |  | 32%   | 1087 | 905  |
|         |        |     |                |   |                              |  |  | 34%   | 1985 | 1806 |
|         |        |     |                |   |                              |  |  | 50%   | 1903 | 1844 |
|         |        |     |                |   |                              |  |  | 90%   | 1782 | 1753 |
|         |        |     |                |   |                              |  |  | 29%   | 264  | 184  |
| HVAET61 | 965365 | 522 | HMMER<br>1.8   | PFAM: Core histones<br>H2A, H2B, H3 and H4  | PF00125                      |  |  | 14.22 | 603  | 695  |
| HVAND08 | 958443 | 527 | blastx.2       | (AF181721) RU2S [Homo<br>sapiens]           | gb AAF23612.1 AF18<br>1721.1 |  |  | 64%   | 2    | 376  |
| HVANR45 | 930308 | 528 | blastx.2       | (AF008197) syncollin<br>[Rattus norvegicus] | gb AAC53314.1                |  |  | 72%   | 56   | 400  |
| HVAOG11 | 966135 | 529 | HMMER<br>2.1.1 | PFAM: Ank repeat                            | PF00023                      |  |  | 36.8  | 286  | 384  |
| HVARE86 | 965243 | 532 | HMMER<br>1.8   | PFAM: Core histones<br>H2A, H2B, H3 and H4  | PF00125                      |  |  | 8.7   | 439  | 495  |

|         |        |     |           |  |                          |      |     |     |
|---------|--------|-----|-----------|--|--------------------------|------|-----|-----|
| HWGQF79 | 882611 | 538 | blastx.2  | trypsin inhibitor (Bowman-Birk) - two-rowed barley   | pir JT0235 TIBHB         | 44%  | 78  | 185 |
| HWLBK80 | 933865 | 543 | blastx.2  | The ha3662 gene product is related to mouse glycerophosphate dehydrogenase. [Homo sapiens]   | dbj BAA07648.1           | 46%  | 236 | 280 |
| HWLEN08 | 958509 | 553 | blastx.2  | predicted using Genefinder; cDNA EST yk488a2.5 comes from this gene [Caenorhabditis elegans] | emb CAB02762.1           | 95%  | 129 | 380 |
| HWLEN20 | 963418 | 554 | HMMER 1.8 | PFAM: Zinc finger, C3HC4 type (RING finger)  | PF00097                  | 31%  | 89  | 538 |
| HWLEO59 | 974078 | 555 | blastx.2  | (AK000385) unnamed protein product [Homo sapiens]  | dbj BAA91131.1           | 8.49 | 198 | 233 |
| HWLFB08 | 849136 | 560 | blastx.2  | ubiquitin-conjugating enzyme [Mus musculus]  | emb CAA76720.1           | 78%  | 241 | 101 |
| HWLFE50 | 830283 | 562 | blastx.2  | (AK000496) unnamed protein product [Homo sapiens]  | dbj BAA91205.1           | 56%  | 401 | 231 |
| HWLFP37 | 708985 | 571 | blastx.2  | (AF090942) PRO0657 [Homo sapiens]  | gb AAF24054.1 AF090942.1 | 80%  | 2   | 517 |
| HWLHP05 | 931087 | 589 | blastx.2  | (AF010144) neuronal thread protein AD7c-NTP [Homo sapiens]                                   | gb AAC08737.1            | 67%  | 326 | 12  |
|         |        |     |           |  |                          | 65%  | 150 | 305 |
|         |        |     |           |  |                          | 54%  | 95  | 166 |
|         |        |     |           |  |                          | 47%  | 418 | 215 |
|         |        |     |           |  |                          | 67%  | 417 | 319 |
|         |        |     |           |  |                          | 78%  | 305 | 249 |
|         |        |     |           |  |                          | 61%  | 417 | 319 |
|         |        |     |           |  |                          | 84%  | 59  | 3   |

|         |        |     |                |   |                              |      |     |     |
|---------|--------|-----|----------------|---|------------------------------|------|-----|-----|
| HWLHR93 | 952387 | 590 | HMMER<br>1.8   | PFAM: Zinc finger, CCHC<br>class                        | PF00098                      | 48%  | 326 | 228 |
| HWLHT06 | 934217 | 591 | blastx.2       | (AK000301) unnamed<br>protein product [Homo<br>sapiens] | dbj BAA91067.1               | 80%  | 47  | 3   |
| HWLIH21 | 917551 | 595 | blastx.2       | (AK000134) unnamed<br>protein product [Homo<br>sapiens] | dbj BAA90965.1               | 52%  | 417 | 349 |
| HWLIL65 | 747440 | 596 | blastx.2       | (AK000496) unnamed<br>protein product [Homo<br>sapiens] | dbj BAA91205.1               | 45%  | 412 | 317 |
| HWLJC30 | 830232 | 603 | blastx.2       | (AK000258) unnamed<br>protein product [Homo<br>sapiens] | dbj BAA91037.1               | 37%  | 326 | 240 |
| HWLJL46 | 830226 | 607 | blastx.2       | (AF090931) PRO0483<br>[Homo sapiens]                    | gb AAF24046.1 AF09<br>0931 1 | 62%  | 307 | 260 |
| HWLJN54 | 729051 | 608 | blastx.2       | (AK000400) unnamed<br>protein product [Homo<br>sapiens] | dbj BAA91140.1               | 100% | 211 | 231 |
| HWLJR77 | 883207 | 611 | HMMER<br>2.1.1 | PFAM: Jacalin-like lectin<br>domain                     | PF01419                      | 55.5 | 271 | 552 |
|         |        |     | blastx.2       | (AC002301) Homolog of<br>rat Zymogen granule            | gb AAC08708.1                | 73%  | 166 | 657 |

|         |        |     |                |   |                          |  |   |                                     |   |
|---------|--------|-----|----------------|---|--------------------------|--|---|-------------------------------------|---|
| HWLKC87 | 956205 | 614 | HMMER<br>1.8   | membrane protein [Homo sapiens]<br>PFAM: UDP-glucuronosyl and UDP-glucosyl transferases | PF00201                  |  | 47.54   | 5                                   | 133   |
|         |        |     | blastx.2       | UDP-glucuronosyltransferase isoform [Homo sapiens]                                      | gb AAD14400.1 S82485_1   |  | 58%   | 5                                   | 121   |
| HWLKW04 | 969141 | 620 | HMMER<br>2.1.1 | PFAM: Ribosomal protein S27   | PF01667                  |  | 107.7   | 176                                 | 310   |
|         |        |     | blastx.2       | (AF070668) 40S ribosomal protein S27 isoform [Homo sapiens]                             | gb AAD20974.1            |  | 82%<br>80%                                    | 95<br>301                           | 322<br>345                                    |
| HWLLB11 | 954849 | 623 | HMMER<br>1.8   | PFAM: Cytochrome P450   | PF00067                  |  | 159.13  | 75                                  | 506   |
|         |        |     | blastx.2       | (AF091117) cytochrome P450 [Orconectes limosus]   | gb AAF09264.1 AF091117_1 |  | 40%<br>53%                                    | 78<br>1                             | 509<br>90                                     |
| HWLNX76 | 887583 | 631 | blastx.2       | (AF126484) CARD4 [Homo sapiens]   | gb AAD29125.1 AF126484_1 |  | 73%<br>93%<br>35%<br>31%<br>33%<br>32%<br>81% | 3<br>301<br>3<br>3<br>3<br>6<br>269 | 371<br>393<br>278<br>281<br>260<br>272<br>301 |
|         |        |     |                |   |                          |  |   |                                     |   |
| HWMAD05 | 931076 | 642 | blastx.2       | galactosylceramide-like protein, GCP - human  | pir JC5238 JC5238        |  | 68%   | 144                                 | 22  |
| HWME565 | 969190 | 645 | HMMER<br>2.1.1 | PFAM: Matrixin  | PF00413                  |  | 45.6  | 17                                  | 109   |

|          |        |     |          |   |                          |                   |                  |                   |
|----------|--------|-----|----------|---|--------------------------|-------------------|------------------|-------------------|
|          |        |     | blastx.2 | (AB000719) hatching enzyme [Hemicentrotus pulcherrimus]   | dbj BAA19171.1           | 51%               | 2                | 304               |
| HWMU56   | 922375 | 646 | blastx.2 | (AB012223) ORF2 [Canis familiaris]                        | dbj BAA25253.1           | 63%<br>53%        | 59<br>380        | 196<br>424        |
| HWMFA28  | 965354 | 647 | blastx.2 | (AE001886) hypothetical protein [Deinococcus radiodurans] | gb AAF09840.1 AE001886_6 | 52%<br>50%        | 178<br>47        | 47<br>6           |
| HWMFG32  | 883180 | 649 | blastx.2 | (AK002129) unnamed protein product [Homo sapiens]         | dbj BAA92096.1           | 75%               | 136              | 5                 |
| HWMGL13  | 947969 | 653 | blastx.2 | laminin alpha 5 chain [Mus musculus]                      | gb AAC53430.1            | 77%<br>62%        | 3<br>376         | 371<br>423        |
| HWMHG26  | 957665 | 655 | blastx.2 | (AL110233) hypothetical protein [Homo sapiens]            | emb CAB53686.1           | 71%<br>78%        | 131<br>42        | 36<br>1           |
| HWMHX12  | 914007 | 658 | blastx.2 | (AB008185) ganglioside sialidase [Homo sapiens]           | dbj BAA82611.1           | 64%<br>40%<br>33% | 15<br>278<br>572 | 275<br>619<br>730 |
| HWMJB68  | 914031 | 662 | blastx.2 | (AK000496) unnamed protein product [Homo sapiens]         | dbj BAA91205.1           | 62%               | 395              | 63                |
| HWMKI01  | 913841 | 664 | blastx.2 | (AK000496) unnamed protein product [Homo sapiens]         | dbj BAA91205.1           | 67%               | 575              | 372               |
| HWMKI10  | 961616 | 665 | blastx.2 | (AF155219) MAB21L2 [Homo sapiens]                         | gb AAD40248.1 AF155219_1 | 100%              | 2                | 286               |
| HWMGLG23 | 961110 | 666 | blastx.2 | (AF151802) CGI-44 protein [Homo sapiens]                  | gb AAD34039.1 AF151802_1 | 100%              | 144              | 242               |

|          |        |     |                |  |                              |            |            |            |
|----------|--------|-----|----------------|--|------------------------------|------------|------------|------------|
| HWNCY59  | 927487 | 675 | blastx.2       | (AF090942) PRO0657<br>[Homo sapiens]   | gb AAF24054.1 AF09<br>0942_1 | 80%        | 210        | 133        |
| HWNNGN09 | 961602 | 680 | HMMER<br>1.8   | PFAM: Ribosomal protein<br>S10   | PF00338                      | 52.21      | 82         | 203        |
|          |        |     | blastx.2       | (AL132880) predicted<br>using Genefinder;<br>preliminary prediction 1        |                              |            |            |            |
| HXOAI14  | 974075 | 682 | blastx.2       | monoclonal antibody<br>variable region heavy chain<br>[Mus musculus]         | emb CAA01970.1               | 80%        | 447        | 70         |
| HWNCN05  | 928791 | 686 | blastx.2       | (AF140675) zinc<br>metalloprotease<br>ADAMTS7 [Homo<br>sapiens]              | gb AAD56358.1 AF14<br>0675_1 | 39%        | 185        | 721        |
| HWNAL06  | 933591 | 689 | blastx.2       | putative ribosomal protein<br>(AA 1-184) [Homo<br>sapiens]                   | emb CAA37793.1               | 73%        | 308        | 421        |
| HWLPN12  | 969572 | 701 | blastx.2       | (AK000496) unnamed<br>protein product [Homo<br>sapiens]                      | dbj BAA91205.1               | 62%<br>64% | 458<br>241 | 249<br>191 |
| HWLOB68  | 908500 | 703 | HMMER<br>2.1.1 | PFAM: KRAB box   | PF01352                      | 125.8      | 87         | 254        |
|          |        |     | blastx.2       | (AJ245586) KRAB protein<br>domain [Homo sapiens]                             |                              |            |            |            |
| HWLNA36  | 974863 | 705 | blastx.2       | (AF106037) adipocyte-<br>derived leucine<br>aminopeptidase [Homo<br>sapiens] | gb AAF07395.1 AF10<br>6037_1 | 96%<br>88% | 586<br>650 | 317<br>576 |



|         |        |     |          |  |                              |  |                                   |  |
|---------|--------|-----|----------|--|------------------------------|--|-----------------------------------|--|
| HWLLZ91 | 887157 | 707 | blastx.2 | (AL022322) bK228A9.2<br>(novel protein similar to<br>FAS-ligand 1 substrate)<br>[Homo sapiens] | emb CAB62940.1               | 98%                                    | 143                               | 463                                    |
| HWLKT19 | 974292 | 709 | blastx.2 | B-cell growth factor<br>[Homo sapiens]   | gb AAB02649.1                | 65%                                    | 367                               | 480                                    |
| HWLKQ11 | 965390 | 710 | blastx.2 | (AK000928) unnamed<br>protein product [Homo<br>sapiens]  | dbj BAA91431.1               | 82%                                    | 109                               | 8                                      |
| HWLKJ18 | 930414 | 711 | blastx.2 | (AK000385) unnamed<br>protein product [Homo<br>sapiens]  | dbj BAA91131.1               | 53%<br>85%                             | 77<br>213                         | 211<br>275                             |
| HWLJW12 | 969556 | 713 | blastx.2 | (AL117639) hypothetical<br>protein [Homo sapiens]  | emb CAB56027.1               | 96%                                    | 408                               | 488                                    |
| HWLHH62 | 876225 | 725 | blastx.2 | (AF115384) LR8 [Homo<br>sapiens]   | gb AAD23440.1 AF11<br>5384 1 | 100%                                   | 4                                 | 108                                    |
| HWLHD19 | 887203 | 726 | blastx.2 | (AF071787) melastatin 1<br>[Homo sapiens]  | gb AAC80000.1                | 43%                                    | 84                                | 629                                    |
| HWLGV14 | 967914 | 727 | blastx.2 | (AF115384) LR8 [Homo<br>sapiens]   | gb AAD23440.1 AF11<br>5384 1 | 95%                                    | 169                               | 384                                    |
| HWLFY91 | 789569 | 729 | blastx.2 | (AF084256) beta<br>glucuronidase isoform d<br>[Homo sapiens]                                   | gb AAD17791.1                | 67%<br>63%                             | 246<br>143                        | 145<br>111                             |
| HWLEM80 | 886651 | 738 | blastx.2 | PC6B [Mus musculus]  | dbj BAA04507.1               | 57%<br>34%<br>36%<br>35%<br>32%<br>33% | 87<br>93<br>117<br>87<br>90<br>87 | 767<br>539<br>539<br>488<br>548<br>512 |

[illegible]

|          |        |     |              |   |                              |              |            |             |
|----------|--------|-----|--------------|---|------------------------------|--------------|------------|-------------|
| HWLBN90  | 787355 | 752 | HMMER<br>1.8 | sapiens]<br>PFAM: HMG (high<br>mobility group) box                                      | PF00505                      |              |            |             |
|          |        |     | blastx.2     | (AF155115) NY-REN-58<br>antigen [Homo sapiens]  | gb AAD42881.1 AF15<br>5115_1 | 100%<br>100% | 440        | 529         |
| HWLBLE75 | 766877 | 753 | blastx.2     | (AF060862) unknown<br>[Homo sapiens]  | gb AAC15461.1                | 95%          | 3          | 137         |
| HWLBI01  | 919168 | 754 | blastx.2     | (AF053356) ORF3,<br>splicevariantc [Homo<br>sapiens]                                    | gb AAC78797.1                | 94%<br>100%  | 107<br>52  | 214<br>72   |
|          |        |     |              |   |                              |              |            |             |
| HWCAD06  | 886808 | 763 | blastx.2     | (AK001122) unnamed<br>protein product [Homo<br>sapiens]                                 | dbj BAA91512.1               | 86%          | 335        | 529         |
| HVASJ79  | 951617 | 765 | blastx.2     | (AF007871) torsinA<br>[Homo sapiens]  | gb AAC51732.1                | 51%<br>39%   | 60<br>888  | 545<br>1076 |
| HUTSF11  | 966029 | 770 | HMMER<br>1.8 | PFAM: Eukaryotic protein<br>kinase domain   | PF00069                      | 27.74        | 3          | 104         |
| HUTAF08  | 958353 | 771 | blastx.2     | ORF1; MER37; putative<br>transposase similar to pogo<br>element [Homo sapiens]          | gb AAB61714.1                | 65%<br>66%   | 390<br>478 | 295<br>386  |
|          |        |     |              |   |                              |              |            |             |
| HUFGC48  | 950707 | 772 | blastx.2     | (AC004988) supported by<br>EST AA458691<br>(NID:g2183598) and<br>Genscan [Homo sapiens] | gb AAD26979.1 AC00<br>4988_1 | 96%<br>90%   | 147<br>287 | 302<br>316  |
| HUFFW06  | 934895 | 773 | blastx.2     | (AF010144) neuronal<br>thread protein AD7c-NTP<br>[Homo sapiens]                        | gb AAC08737.1                | 43%<br>48%   | 508<br>343 | 329<br>251  |
| HUFDO11  | 966407 | 775 | blastx.2     | (AK000385) unnamed  | dbj BAA91131.1               | 57%          | 400        | 155         |

|         |        |     |           |   |                          |       |     |     |
|---------|--------|-----|-----------|---|--------------------------|-------|-----|-----|
| HUFDN22 | 783765 | 776 | blastx.2  | protein product [Homo sapiens]<br>(AF071173) Herc2 [Mus musculus] | gb AAD08658.1            | 69%   | 173 | 135 |
| HUFCI80 | 773161 | 781 | blastx.2  | (AF151906) CGI-148 protein [Homo sapiens]                         | gb AAD34143.1 AF151906.1 | 98%   | 522 | 821 |
| HUFBP22 | 582067 | 782 | blastx.2  | telomerase-associated protein TP-1 [Homo sapiens]                 | gb AAC51107.1            | 100%  | 371 | 520 |
| HUFBD16 | 661856 | 783 | blastx.2  | transformation-related protein [Homo sapiens]                     | gb AAA36776.1            | 54%   | 378 | 220 |
| HUFAJ16 | 621443 | 787 | blastx.2  | alternatively spliced product using exon 13A [Homo sapiens]       | gb AAB49034.1            | 72%   | 742 | 512 |
| HTPFF82 | 869864 | 792 | blastx.2  | (AF118082) PRO1902 [Homo sapiens]                                 | gb AAF22026.1 AF118094.2 | 50%   | 2   | 226 |
| HTPBU35 | 530440 | 805 | blastx.2  | (AF109377) ldlBp [Mus musculus]                                   | gb AAD13780.1            | 48%   | 8   | 364 |
| HTPAP93 | 791415 | 808 | blastx.2  | (AK001374) unnamed protein product [Homo sapiens]                 | dbj BAA91657.1           | 78%   | 64  | 189 |
| HTPAI20 | 937644 | 810 | blastx.2  | (AK000305) unnamed protein product [Homo sapiens]                 | dbj BAA91071.1           | 88%   | 3   | 53  |
| HSPAB58 | 736098 | 822 | HMMER 1.8 | PFAM: Zinc-binding metalloprotease domain                         | PF00099                  | 96%   | 33  | 218 |
| HSODZ07 | 955932 | 824 | HMMER     | PFAM: RNA recognition   | PF00076                  | 98%   | 2   | 418 |
|         |        |     |           |   |                          | 4.6   | 39  | 86  |
|         |        |     |           |   |                          | 14.64 | 317 | 388 |

|         |        |     |           |  |                |       |     |     |  |
|---------|--------|-----|-----------|--|----------------|-------|-----|-----|--|
|         |        |     | 1.8       | motif. (aka RRM, RBD, or RNP domain)                 |                |       |     |     |  |
|         |        |     | blastx.2  | (AK000867) unnamed protein product [Homo sapiens]    | dbj BAA91401.1 | 53%   | 311 | 496 |  |
| HSOBE61 | 908598 | 842 | HMMER 1.8 | PFAM: Zinc finger, C2H2 type                         | PF00096        | 11.74 | 226 | 288 |  |
|         |        |     | blastx.2  | zinc finger protein [Homo sapiens]                   | emb CAA55532.1 | 62%   | 1   | 300 |  |
|         |        |     |           |  |                | 50%   | 28  | 381 |  |
|         |        |     |           |  |                | 58%   | 13  | 300 |  |
|         |        |     |           |  |                | 59%   | 16  | 300 |  |
|         |        |     |           |  |                | 52%   | 73  | 381 |  |
|         |        |     |           |  |                | 51%   | 13  | 300 |  |
|         |        |     |           |  |                | 67%   | 356 | 493 |  |
|         |        |     |           |  |                | 63%   | 356 | 493 |  |
|         |        |     |           |  |                | 63%   | 356 | 493 |  |
|         |        |     |           |  |                | 54%   | 356 | 493 |  |
|         |        |     |           |  |                | 67%   | 356 | 475 |  |
|         |        |     |           |  |                | 56%   | 356 | 493 |  |
|         |        |     |           |  |                | 56%   | 347 | 490 |  |
|         |        |     |           |  |                | 38%   | 356 | 463 |  |
|         |        |     |           |  |                | 52%   | 288 | 335 |  |
| HSOAV11 | 967590 | 847 | blastx.2  | (AK001374) unnamed protein product [Homo sapiens]    | dbj BAA91657.1 | 100%  | 372 | 473 |  |
| HSIGJ94 | 793624 | 857 | HMMER 1.8 | PFAM: Phorbol esters / diacylglycerol binding domain | PF00130        | 3.15  | 207 | 239 |  |
| HSIGG54 | 887545 | 858 | blastx.2  | vasopressin receptor                                 | gb AAA03623.1  | 53%   | 78  | 311 |  |

|         |        |     |                |  |                               |                          |                          |                          |
|---------|--------|-----|----------------|--|-------------------------------|--------------------------|--------------------------|--------------------------|
| HSIFR52 | 726370 | 867 | blastx.2       | [Rattus norvegicus]<br>(AK001040) unnamed<br>protein product [Homo<br>sapiens] | dbj BAA91477.1                | 100%                     | 3                        | 251                      |
| HSIFK84 | 782810 | 869 | blastx.2       | (AF050078) growth arrest<br>specific 11 [Homo sapiens]                         | gb AAC69518.1                 | 58%<br>43%<br>68%        | 331<br>305<br>77         | 498<br>520<br>163        |
| HSIDZ18 | 666892 | 875 | blastx.2       | (AK000627) unnamed<br>protein product [Homo<br>sapiens]                        | dbj BAA91294.1                | 88%<br>92%               | 36<br>1                  | 296<br>39                |
| HSICQ22 | 675004 | 886 | blastx.2       | (AK001659) unnamed<br>protein product [Homo<br>sapiens]                        | dbj BAA91818.1                | 100%                     | 292                      | 152                      |
| HSICP86 | 785733 | 887 | HMMER<br>2.1.1 | PFAM: MAM domain.  | PF00629                       | 48.4                     | 133                      | 318                      |
|         |        |     | blastx.2       | MAM domain protein<br>[Xenopus laevis]   | gb AAC59868.1                 | 77%                      | 64                       | 318                      |
| HSIBB22 | 518673 | 889 | blastx.2       | (AK000496) unnamed<br>protein product [Homo<br>sapiens]                        | dbj BAA91205.1                | 64%<br>62%               | 186<br>259               | 43<br>188                |
| HSIAL16 | 496026 | 891 | blastx.2       | (AF118082) PRO1902<br>[Homo sapiens]   | gb AAF22026.1 AF11<br>8094_21 | 75%<br>72%<br>65%<br>73% | 638<br>384<br>478<br>502 | 492<br>286<br>374<br>458 |
| HSGAA12 | 971541 | 899 | blastx.2       | p40 [Homo sapiens]   | gb AAC51270.1                 | 40%<br>26%               | 205<br>75                | 432<br>194               |
| HRTAN72 | 766328 | 903 | blastx.2       | unknown [Homo sapiens]   | gb AAB50206.1                 | 67%<br>34%               | 150<br>28                | 260<br>114               |

|         |        |     |                         |  |                                     |                              |                          |                          |
|---------|--------|-----|-------------------------|--|-------------------------------------|------------------------------|--------------------------|--------------------------|
| HRTAE57 | 871385 | 907 | blastx.2                | (AF201947) MEK binding partner 1 [Homo sapiens]  | gb AAF17239.1 AF201947_1            | 87%                          | 158                      | 388                      |
| HRODU82 | 779482 | 913 | blastx.2                | (AB017551) 16G2 [Homo sapiens]   | dbj BAA78341.1                      | 87%<br>93%<br>87%            | 5<br>376<br>312          | 334<br>522<br>383        |
| HRODD02 | 918978 | 915 | blastx.2                | (AF205935) MGA protein [Mus musculus]  | gb AAF24761.1                       | 59%<br>71%<br>38%            | 27<br>158<br>3           | 188<br>268<br>80         |
| HROAZ07 | 973603 | 931 | HMMER 1.8<br>blastx.2   | PFAM: Flagella basal body rod proteins<br>Molybdopterin-converting factor 16k chain [Escherichia coli] | PF00460<br>dbj BAA35443.1           | 33.9%<br>70%                 | 5<br>113                 | 97<br>469                |
| HROAL96 | 867080 | 938 | blastx.2                | unknown [Homo sapiens]   | gb AAB50206.1                       | 71%                          | 662                      | 456                      |
| HNSMC05 | 840216 | 950 | blastx.2                | (AL110249) hypothetical protein [Homo sapiens]   | emb CAB53697.1                      | 79%                          | 417                      | 590                      |
| HNSAA51 | 971484 | 951 | HMMER 2.1.1<br>blastx.2 | PFAM: Glycosyl hydrolases family 18<br>(AB025008) novel member of chitinase family [Homo sapiens]      | PF00704<br>dbj BAA86980.1           | 94.6%<br>83%                 | 76<br>55                 | 279<br>612               |
| HNKAZ51 | 947067 | 953 | HMMER 1.8<br>blastx.2   | PFAM: Trypsin<br>(AF064819) serine protease DESC1 [Homo sapiens]                                       | PF00089<br>gb AAF04328.1 AF064819_1 | 124.58%<br>42%<br>35%<br>46% | 259<br>100<br>677<br>603 | 594<br>603<br>832<br>686 |
| HNAAE09 | 888913 | 961 | blastx.2                | unnamed protein product [unidentified]   | emb CAB69195.1                      | 100%                         | 2                        | 70                       |

|         |        |     |                            |   |                           |                   |                   |                   |
|---------|--------|-----|----------------------------|---|---------------------------|-------------------|-------------------|-------------------|
| HMZME85 | 861084 | 962 | blastx.2                   | (AF089744) xenotropic and polytropic murine leukemia virus receptor X3 [Homo sapiens]                                       | gb AAD10196.1             | 96%<br>83%        | 2<br>442          | 418<br>672        |
| HMZAC09 | 625188 | 966 | blastx.2                   | (AB026833) chloride channel protein [Homo sapiens]  | dbj BAA77810.1            | 84%<br>48%        | 288<br>637        | 596<br>717        |
| HLQIF28 | 856619 | 970 | HMMER<br>2.1.1<br>blastx.2 | PFAM: FMN-dependent dehydrogenase<br>(AB024079) a liver-specific gene similar to the plant glycolate oxidase [Homo sapiens] | PF01070<br>dbj BAA82872.1 | 102.6<br>79%      | 67<br>25          | 267<br>354        |
| HLQHD03 | 856624 | 971 | blastx.2                   | (AF090930) PRO0478 [Homo sapiens]   | gb AAF24045.1 AF090930 1  | 76%               | 127               | 240               |
| HLQGP25 | 893692 | 974 | blastx.2                   | (AK000928) unnamed protein product [Homo sapiens]   | dbj BAA91431.1            | 74%               | 414               | 506               |
| HLQFQ08 | 961154 | 978 | blastx.2                   | (AL021474) similar to BPTI/KUNITZ inhibitor domain; cDNA EST 111  | emb CAA16311.1            | 61%<br>35%<br>40% | 421<br>318<br>497 | 329<br>124<br>417 |
| HLQED04 | 969543 | 984 | blastx.2                   | (AC003034) Homolog of rat kidney-specific (KS) gene [Homo sapiens]  | gb AAC23497.1             | 63%               | 275               | 96                |
| HLQDV62 | 743401 | 985 | blastx.2                   | (AF072934) translational release factor 1 [Homo sapiens]  | gb AAD12759.1             | 73%               | 2                 | 136               |
| HLQDJ01 | 916193 | 996 | blastx.2                   | (AF090942) PRO0657 [Homo sapiens]   | gb AAF24054.1 AF090942 1  | 72%               | 6                 | 137               |



|         |        |      |                            |   |                               |                          |                       |                          |
|---------|--------|------|----------------------------|---|-------------------------------|--------------------------|-----------------------|--------------------------|
| HLQDE32 | 707639 | 1000 | HMMER<br>2.1.1             | PFAM: UBA domain  | PF00627                       | 48                       | 471                   | 578                      |
| HLQDB69 | 934462 | 1002 | HMMER<br>2.1.1<br>blastx.2 | PFAM: Calponin<br>homology (CH) domain<br>(AL137527) hypothetical<br>protein [Homo sapiens] | PF00307                       | 23.2                     | 108                   | 350                      |
| HLQCY79 | 774827 | 1005 | blastx.2                   | (AF118082) PRO1902<br>[Homo sapiens]  | emb CAB70791.1                | 80%                      | 12                    | 476                      |
| HLQCI96 | 823602 | 1011 | blastx.2                   | (AF117234) flotillin<br>[Homo sapiens]  | gb AAF22026.1 AF11<br>8094_21 | 56%<br>66%               | 72<br>38              | 167<br>82                |
| HLPBA84 | 912828 | 1021 | blastx.2                   | (AK000241) unnamed<br>protein product [Homo<br>sapiens]                                     | gb AAF17215.1 AF11<br>7234_1  | 58%<br>47%<br>56%<br>77% | 78<br>3<br>353<br>388 | 344<br>305<br>448<br>414 |
| HLDOS76 | 770016 | 1042 | blastx.2                   | (AK000496) unnamed<br>protein product [Homo<br>sapiens]                                     | dbj BAA91205.1                | 73%<br>36%               | 21<br>412             | 143<br>477               |
| HLDOK25 | 678063 | 1044 | blastx.2                   | (AF118082) PRO1902<br>[Homo sapiens]  | gb AAF22026.1 AF11<br>8094_21 | 58%<br>66%               | 542<br>439            | 426<br>368               |
| HLDOD83 | 724046 | 1046 | blastx.2                   | (AF169017)<br>forminotransferase<br>cyclodeaminase [Homo<br>sapiens]                        | gb AAF15558.1 AF16<br>9017_1  | 98%<br>88%<br>100%       | 625<br>309<br>662     | 296<br>232<br>633        |
| HLDOC67 | 689240 | 1047 | blastx.2                   | (AF182510) ECSIT [Mus<br>musculus]  | gb AAF01219.1 AF18<br>2510_1  | 64%<br>83%<br>45%        | 129<br>2<br>326       | 320<br>145<br>451        |
| HLNLS57 | 963552 | 1051 | blastx.2                   | (AK001778) unnamed  | dbj BAA91904.1                | 100%                     | 115                   | 267                      |

|         |        |      |                            |  |                           |                      |                   |                   |
|---------|--------|------|----------------------------|--|---------------------------|----------------------|-------------------|-------------------|
| HLDBV65 | 764915 | 1058 | HMMER<br>2.1.1<br>blastx.2 | protein product [Homo sapiens]<br>PFAM: POLO box duplicated region.<br>(AF059617) serum-inducible kinase [Homo sapiens]  | PF00659                   | 96%<br>93%           | 42<br>2           | 119<br>49         |
| HLDBN55 | 731734 | 1060 | blastx.2                   | (AB028021) hepatocyte nuclear factor-3 beta [Homo sapiens]   | dbj BAA78106.1            | 100%                 | 45                | 221               |
| HLDBN03 | 924100 | 1062 | blastx.2                   | (AK001542) unnamed protein product [Homo sapiens]  | dbj BAA91748.1            | 100%<br>81%<br>100%  | 3<br>413<br>364   | 362<br>694<br>411 |
| HLDBE09 | 625554 | 1064 | blastx.2                   | (AK000385) unnamed protein product [Homo sapiens]  | dbj BAA91131.1            | 73%<br>65%<br>100%   | 424<br>291<br>221 | 290<br>223<br>180 |
| HLDBD02 | 920039 | 1066 | blastx.2                   | (AF113685) PRO0974 [Homo sapiens]  | gb AAF29584.1 AF113685_1  | 52%                  | 2                 | 247               |
| HLDBB21 | 713680 | 1068 | HMMER<br>1.8<br>blastx.2   | PFAM: Elongation factor Tu family (contains ATP/GTP binding P-loop)<br>mitochondrial elongation factor Tu [Homo sapiens] | PF00009<br>emb CAA59169.1 | 44.67%<br>96%<br>98% | 2<br>152<br>2     | 166<br>376<br>166 |
| HLDAV38 | 709140 | 1071 | blastx.2                   | (AF118086) PRO1992 [Homo sapiens]  | gb AAF22030.1 AF118094_25 | 78%                  | 8                 | 106               |
| HLDAK33 | 857107 | 1075 | blastx.2                   | (AF072441) calcineurin binding protein cabin 1 [Homo sapiens]  | gb AAD40846.1 AF072441_1  | 98%                  | 445               | 2                 |

|         |        |      |             |   |                          |      |     |     |
|---------|--------|------|-------------|---|--------------------------|------|-----|-----|
| HISEI01 | 915375 | 1081 | blastx.2    | (AK000284) unnamed protein product [Homo sapiens]           | dbj BAA91053.1           | 100% | 131 | 244 |
| HISEF78 | 841308 | 1082 | blastx.2    | (AL049996) hypothetical protein [Homo sapiens]              | emb CAB43230.1           | 56%  | 73  | 281 |
| HISDW49 | 928682 | 1083 | HMMER 2.1.1 | PFAM: Monooxygenase   | PF01360                  | 83.7 | 517 | 744 |
| HISCQ82 | 975205 | 1087 | blastx.2    | (AF132944) CGI-10 protein [Homo sapiens]                    | gb AAD27719.1 AF132944_1 | 98%  | 991 | 388 |
| HISCF31 | 950628 | 1093 | blastx.2    | unknown protein [Homo sapiens]                              | gb AAA88036.1            | 46%  | 469 | 476 |
| HISBW78 | 840252 | 1095 | blastx.2    | (AF159423) cysteine-rich hydrophobic 2 CHIC2 [Homo sapiens] | gb AAD55981.1 AF159423_1 | 73%  | 534 | 205 |
| HISAB77 | 772155 | 1121 | blastx.2    | Pro-Pol-dUTPase polypeptide [Mus musculus]                  | emb CAA73251.1           | 45%  | 1   | 345 |
| HGODA23 | 675097 | 1131 | blastx.2    | (AK000496) unnamed protein product [Homo sapiens]           | dbj BAA91205.1           | 70%  | 255 | 61  |
| HGBHM18 | 854310 | 1137 | blastx.2    | (AK000844) unnamed protein product [Homo sapiens]           | dbj BAA91396.1           | 66%  | 151 | 2   |
| HGBHK55 | 713512 | 1138 | blastx.2    | (AF095446) syndesmos [Gallus gallus]                        | gb AAF29566.1 AF095446_1 | 64%  | 142 | 216 |
|         |        |      |             | (AF000145) germinal center kinase related                   | gb AAC15472.1            | 94%  | 323 | 373 |
|         |        |      |             |   |                          | 100% | 314 | 400 |

|         |        |      |              |  |                          |                          |                      |                        |
|---------|--------|------|--------------|--|--------------------------|--------------------------|----------------------|------------------------|
| HGBHG78 | 942445 | 1139 | blastx.2     | protein kinase [Homo sapiens]<br>(AC024214) contains similarity to Pfam families PF01391_1_1 | gb AAF36081.1            | 32%<br>25%               | 127<br>677           | 483<br>784             |
| HGBHD89 | 493910 | 1142 | blastx.2     | (AK000385) unnamed protein product [Homo sapiens]  | dbj BAA91131.1           | 61%                      | 46                   | 381                    |
| HGBHB27 | 950174 | 1144 | blastx.2     | (AF114494) putative tyrosine phosphatase [Homo sapiens]                                      | gb AAF21976.1 AF114494_1 | 98%                      | 858                  | 97                     |
| HGBFP63 | 745487 | 1151 | blastx.2     | cytoplasmic dynein heavy chain [Rattus norvegicus]   | dbj BAA02996.1           | 98%<br>93%<br>100%       | 1<br>279<br>412      | 276<br>425<br>459      |
| HGBDU06 | 960558 | 1155 | blastx.2     | (AJ006529) putative phosphatase [Gallus gallus]  | emb CAA07090.1           | 39%                      | 1                    | 498                    |
| HFVKC87 | 886358 | 1169 | blastx.2     | IDN4-GGTR14 PROTEIN.   | sp Q9Y6Y5 Q9Y6Y5         | 100%                     | 1                    | 87                     |
| HFVIC30 | 881306 | 1175 | blastx.2     | (AF097518) liver-specific transporter [Homo sapiens]   | gb AAD37091.1 AF097518_1 | 76%<br>75%<br>84%        | 6<br>329<br>289      | 290<br>424<br>363      |
| HFLVG70 | 757521 | 1183 | blastx.2     | (AL050294) hypothetical protein [Homo sapiens]   | emb CAB43393.1           | 64%<br>80%<br>50%<br>33% | 87<br>322<br>13<br>4 | 161<br>381<br>75<br>57 |
| HFLQJ68 | 753216 | 1187 | HMMER<br>1.8 | PFAM: Zinc finger, C2H2 type   | PF000096                 | 4.86                     | 90                   | 158                    |
| HFLQJ38 | 709034 | 1188 | blastx.2     | (AK000324) unnamed protein product [Homo sapiens]  | dbj BAA91086.1           | 53%<br>69%               | 3<br>196             | 299<br>342             |

|         |        |      |                            |   |   |                          |                         |                          |
|---------|--------|------|----------------------------|---|---|--------------------------|-------------------------|--------------------------|
| HDDAF49 | 911314 | 1193 | HMMER<br>1.8<br>blastx.2   | sapiens]<br>PFAM: Zinc-binding<br>metalloprotease domain<br>(AL133047) hypothetical<br>protein [Homo sapiens] | PF00099                                 | 5.07                     | 144                     | 173                      |
| HCYBO59 | 520114 | 1198 | blastx.2                   | (AF006514) CHD2 [Homo<br>sapiens]   | gb AAB87382.1                           | 65%<br>69%               | 101<br>349              | 361<br>387               |
| HCROA43 | 948286 | 1203 | HMMER<br>2.1.1<br>blastx.2 | PFAM: von Willebrand<br>factor type C domain<br>(AF168680) cysteine-rich<br>repeat-containing protein 1       | PF00093<br>gb AAF34410.1 AF16<br>8680_1 | 83.7                     | 181                     | 351                      |
| HCRND06 | 934631 | 1205 | blastx.2                   | ZZ:beta-Gal' IgG-binding<br>fusion protein [unidentified<br>cloning 1   | gb AAB00807.1                           | 73%                      | 477                     | 599                      |
| HCQDE22 | 949991 | 1208 | blastx.2                   | (AF072816) ABC-type<br>transporter MRP3 [Rattus<br>norvegicus]  | gb AAC25416.1                           | 48%<br>36%<br>70%<br>29% | 401<br>221<br>685<br>88 | 694<br>403<br>744<br>249 |
| HCNAY45 | 716992 | 1227 | blastx.2                   | hypothetical protein Tigger<br>2 - human transposon<br>MER37 1  | pir S72489 S72489                       | 85%                      | 602                     | 477                      |
| HCNAT67 | 508295 | 1229 | blastx.2                   | (AF161356) HSPC093<br>[Homo sapiens]  | gb AAF28916.1 AF16<br>1356_1            | 73%<br>48%               | 206<br>90               | 274<br>218               |
| HALSD90 | 500844 | 1244 | blastx.2                   | (AF003535) ORF2-like<br>protein [Homo sapiens]  | gb AAD04635.1                           | 47%<br>55%               | 231<br>340              | 10<br>233                |

|         |        |      |                |   |                          |       |     |     |
|---------|--------|------|----------------|---|--------------------------|-------|-----|-----|
| HALSC18 | 667044 | 1249 | blastx.2       | (AF090942) PRO0657<br>[Homo sapiens]  | gb AAF24054.1 AF090942_1 | 61%   | 108 | 320 |
| H2MBH48 | 908926 | 1255 | HMMER<br>2.1.1 | PFAM: Zinc finger, C2H2<br>type   | PF00096                  | 59.4  | 268 | 336 |
|         |        |      | blastx.2       | (AF192913) zinc finger<br>protein ZNF180 [Homo<br>sapiens]  | gb AAF07950.1 AF192913_1 | 47%   | 55  | 498 |
|         |        |      |                |   |                          | 50%   | 55  | 453 |
|         |        |      |                |   |                          | 44%   | 34  | 498 |
|         |        |      |                |   |                          | 44%   | 58  | 498 |
|         |        |      |                |   |                          | 47%   | 55  | 462 |
|         |        |      |                |   |                          | 47%   | 58  | 453 |
|         |        |      |                |   |                          | 43%   | 58  | 501 |
|         |        |      |                |   |                          | 50%   | 103 | 453 |
|         |        |      |                |   |                          | 47%   | 58  | 444 |
| H2MBE37 | 597070 | 1256 | blastx.2       | IDN4-GGTR14 PROTEIN.  | sp Q9Y6Y5 Q9Y6Y5         | 87%   | 1   | 96  |
|         |        |      | HMMER<br>1.8   | PFAM: TPR Domain  | PF00515                  | 12.31 | 64  | 108 |
|         |        |      | blastx.2       | (AF075050) similar to<br>(AJ223828) small<br>glutamine-rich<br>tetrapeptide (SGT)<br>[Homo sapiens] | gb AAC28459.1            | 87%   | 109 | 432 |
|         |        |      |                |   |                          |       |     |     |
|         |        |      |                |   |                          |       |     |     |
| H2MBA41 | 711567 | 1257 |                |   |                          |       |     |     |

[074] Table 2 further characterizes certain encoded polypeptides of the invention, by providing the results of comparisons to protein and protein family databases. The first column provides a unique clone identifier, "Clone ID NO:", corresponding to a cDNA clone disclosed in Table 1A. The second column provides the unique contig identifier, "Contig ID:" which allows correlation with the information in Table 1A. The third column provides the sequence identifier, "SEQ ID NO:X", for the contig polynucleotide sequences. The fourth column provides the analysis method by which the homology/identity disclosed in the row was determined. The fifth column provides a description of PFam/NR hits having significant matches identified by each analysis. Column six provides the accession number of the PFam/NR hit disclosed in the fifth column. Column seven, "Score/Percent Identity", provides a quality score or the percent identity, of the hit disclosed in column five. Comparisons were made between polypeptides encoded by polynucleotides of the invention and a non-redundant protein database (herein referred to as "NR"), or a database of protein families (herein referred to as "PFam"), as described below.

[075] The NR database, which comprises the NBRF PIR database, the NCBI GenPept database, and the SIB SwissProt and TrEMBL databases, was made non-redundant using the computer program nrdb2 (Warren Gish, Washington University in Saint Louis). Each of the polynucleotides shown in Table 1A, column 3 (e.g., SEQ ID NO:X or the 'Query' sequence) was used to search against the NR database. The computer program BLASTX was used to compare a 6-frame translation of the Query sequence to the NR database (for information about the BLASTX algorithm please see Altshul et al., J. Mol. Biol. 215:403-410 (1990), and Gish et al., Nat. Genet. 3:266-272 (1993)). A description of the sequence that is most similar to the Query sequence (the highest scoring 'Subject') is shown in column five of Table 2 and the database accession number for that sequence is provided in column six. The highest scoring 'Subject' is reported in Table 2 if (a) the estimated probability that the match occurred by chance alone is less than  $1.0e-07$ , and (b) the match was not to a known repetitive element. BLASTX returns alignments of short polypeptide segments of the Query and Subject sequences which share a high degree of similarity; these segments are known as High-Scoring Segment Pairs or HSPs. Table 2 reports the degree of similarity between the Query and the Subject for each HSP as a percent identity in Column 7.

The percent identity is determined by dividing the number of exact matches between the two aligned sequences in the HSP, dividing by the number of Query amino acids in the HSP and multiplying by 100. The polynucleotides of SEQ ID NO:X which encode the polypeptide sequence that generates an HSP are delineated by columns 8 and 9 of Table 2.

[076] The PFam database, PFam version 5.2, (Sonnhammer et al., Nucl. Acids Res., 26:320-322, (1998)) consists of a series of multiple sequence alignments; one alignment for each protein family. Each multiple sequence alignment is converted into a probability model called a Hidden Markov Model, or HMM, that represents the position-specific variation among the sequences that make up the multiple sequence alignment (see, e.g., R. Durbin et al., *Biological sequence analysis: probabilistic models of proteins and nucleic acids*, Cambridge University Press, 1998 for the theory of HMMs). The program HMMER version 1.8 (Sean Eddy, Washington University in Saint Louis) was used to compare the predicted protein sequence for each Query sequence (SEQ ID NO:Y in Table 1A) to each of the HMMs derived from PFam version 5.2. A HMM derived from PFam version 5.2 was said to be a significant match to a polypeptide of the invention if the score returned by HMMER 1.8 was greater than 0.8 times the HMMER 1.8 score obtained with the most distantly related known member of that protein family. The description of the PFam family which shares a significant match with a polypeptide of the invention is listed in column 5 of Table 2, and the database accession number of the PFam hit is provided in column 6. Column 7 provides the score returned by HMMER version 1.8 for the alignment. Columns 8 and 9 delineate the polynucleotides of SEQ ID NO:X which encode the polypeptide sequence which shows a significant match to a PFam protein family.

[077] As mentioned, columns 8 and 9 in Table 2, "NT From" and "NT To", delineate the polynucleotides of "SEQ ID NO:X" that encode a polypeptide having a significant match to the PFam/NR database as disclosed in the fifth column of Table 2. In one embodiment, the invention provides a protein comprising, or alternatively consisting of, a polypeptide encoded by the polynucleotides of SEQ ID NO:X delineated in columns 8 and 9 of Table 2. Also provided are polynucleotides encoding such proteins, and the complementary strand thereto.



[078] The nucleotide sequence SEQ ID NO:X and the translated SEQ ID NO:Y are sufficiently accurate and otherwise suitable for a variety of uses well known in the art and described further below. For instance, the nucleotide sequences of SEQ ID NO:X are useful for designing nucleic acid hybridization probes that will detect nucleic acid sequences contained in SEQ ID NO:X or the cDNA contained in Clone ID NO:Z. These probes will also hybridize to nucleic acid molecules in biological samples, thereby enabling immediate applications in chromosome mapping, linkage analysis, tissue identification and/or typing, and a variety of forensic and diagnostic methods of the invention. Similarly, polypeptides identified from SEQ ID NO:Y may be used to generate antibodies which bind specifically to these polypeptides, or fragments thereof, and/or to the polypeptides encoded by the cDNA clones identified in, for example, Table 1A.

[079] Nevertheless, DNA sequences generated by sequencing reactions can contain sequencing errors. The errors exist as misidentified nucleotides, or as insertions or deletions of nucleotides in the generated DNA sequence. The erroneously inserted or deleted nucleotides cause frame shifts in the reading frames of the predicted amino acid sequence. In these cases, the predicted amino acid sequence diverges from the actual amino acid sequence, even though the generated DNA sequence may be greater than 99.9% identical to the actual DNA sequence (for example, one base insertion or deletion in an open reading frame of over 1000 bases).

[080] Accordingly, for those applications requiring precision in the nucleotide sequence or the amino acid sequence, the present invention provides not only the generated nucleotide sequence identified as SEQ ID NO:X, and a predicted translated amino acid sequence identified as SEQ ID NO:Y, but also a sample of plasmid DNA containing cDNA Clone ID NO:Z (deposited with the ATCC on October 5, 2000, and receiving ATCC designation numbers PTA 2574 and PTA 2575; deposited with the ATCC on January 5, 2001, having the depositor reference numbers TS-1, TS-2, AC-1, and AC-2; and/or as set forth, for example, in Table 1A, 6 and 7). The nucleotide sequence of each deposited clone can readily be determined by sequencing the deposited clone in accordance with known methods. Further, techniques known in the art can be used to verify the nucleotide sequences of SEQ ID NO:X.

[081] The predicted amino acid sequence can then be verified from such deposits. Moreover, the amino acid sequence of the protein encoded by a particular clone can also be directly determined by peptide sequencing or by expressing the protein in a suitable host cell containing the deposited human cDNA, collecting the protein, and determining its sequence.

*RACE Protocol For Recovery of Full-Length Genes*

[082] Partial cDNA clones can be made full-length by utilizing the rapid amplification of cDNA ends (RACE) procedure described in Frohman, M.A., et al., Proc. Nat'l. Acad. Sci. USA, 85:8998-9002 (1988). A cDNA clone missing either the 5' or 3' end can be reconstructed to include the absent base pairs extending to the translational start or stop codon, respectively. In some cases, cDNAs are missing the start codon of translation. The following briefly describes a modification of this original 5' RACE procedure. Poly A<sup>+</sup> or total RNA is reverse transcribed with Superscript II (Gibco/BRL) and an antisense or complementary primer specific to the cDNA sequence. The primer is removed from the reaction with a Microcon Concentrator (Amicon). The first-strand cDNA is then tailed with dATP and terminal deoxynucleotide transferase (Gibco/BRL). Thus, an anchor sequence is produced which is needed for PCR amplification. The second strand is synthesized from the dA-tail in PCR buffer, Taq DNA polymerase (Perkin-Elmer Cetus), an oligo-dT primer containing three adjacent restriction sites (XhoI, SalI and ClaI) at the 5' end and a primer containing just these restriction sites. This double-stranded cDNA is PCR amplified for 40 cycles with the same primers as well as a nested cDNA-specific antisense primer. The PCR products are size-separated on an ethidium bromide-agarose gel and the region of gel containing cDNA products the predicted size of missing protein-coding DNA is removed. cDNA is purified from the agarose with the Magic PCR Prep kit (Promega), restriction digested with XhoI or SalI, and ligated to a plasmid such as pBluescript SKII (Stratagene) at XhoI and EcoRV sites. This DNA is transformed into bacteria and the plasmid clones sequenced to identify the correct protein-coding inserts. Correct 5' ends are confirmed by comparing this sequence with the putatively identified homologue and overlap with the partial cDNA clone. Similar

methods known in the art and/or commercial kits are used to amplify and recover 3' ends.

[083] Several quality-controlled kits are commercially available for purchase. Similar reagents and methods to those above are supplied in kit form from Gibco/BRL for both 5' and 3' RACE for recovery of full length genes. A second kit is available from Clontech which is a modification of a related technique, SLIC (single-stranded ligation to single-stranded cDNA), developed by Dumas et al., *Nucleic Acids Res.*, 19:5227-32 (1991). The major differences in procedure are that the RNA is alkaline hydrolyzed after reverse transcription and RNA ligase is used to join a restriction site-containing anchor primer to the first-strand cDNA. This obviates the necessity for the dA-tailing reaction which results in a polyT stretch that is difficult to sequence past.

[084] An alternative to generating 5' or 3' cDNA from RNA is to use cDNA library double-stranded DNA. An asymmetric PCR-amplified antisense cDNA strand is synthesized with an antisense cDNA-specific primer and a plasmid-anchored primer. These primers are removed and a symmetric PCR reaction is performed with a nested cDNA-specific antisense primer and the plasmid-anchored primer.

*RNA Ligase Protocol For Generating The 5' or 3' End Sequences To Obtain Full Length Genes*

[085] Once a gene of interest is identified, several methods are available for the identification of the 5' or 3' portions of the gene which may not be present in the original cDNA plasmid. These methods include, but are not limited to, filter probing, clone enrichment using specific probes and protocols similar and identical to 5' and 3' RACE. While the full length gene may be present in the library and can be identified by probing, a useful method for generating the 5' or 3' end is to use the existing sequence information from the original cDNA to generate the missing information. A method similar to 5' RACE is available for generating the missing 5' end of a desired full-length gene. (This method was published by Fromont-Racine et al., *Nucleic Acids Res.*, 21(7):1683-1684 (1993)). Briefly, a specific RNA oligonucleotide is ligated to the 5' ends of a population of RNA presumably containing full-length gene RNA transcript. A primer set containing a primer specific to the ligated RNA oligonucleotide and a primer specific to a known sequence of the gene of interest, is

used to PCR amplify the 5' portion of the desired full length gene which may then be sequenced and used to generate the full length gene. This method starts with total RNA isolated from the desired source, poly A RNA may be used but is not a prerequisite for this procedure. The RNA preparation may then be treated with phosphatase if necessary to eliminate 5' phosphate groups on degraded or damaged RNA which may interfere with the later RNA ligase step. The phosphatase, if used, is then inactivated and the RNA is treated with tobacco acid pyrophosphatase in order to remove the cap structure present at the 5' ends of messenger RNAs. This reaction leaves a 5' phosphate group at the 5' end of the cap cleaved RNA which can then be ligated to an RNA oligonucleotide using T4 RNA ligase. This modified RNA preparation can then be used as a template for first strand cDNA synthesis using a gene specific oligonucleotide. The first strand synthesis reaction can then be used as a template for PCR amplification of the desired 5' end using a primer specific to the ligated RNA oligonucleotide and a primer specific to the known sequence of the digestive system antigen of interest. The resultant product is then sequenced and analyzed to confirm that the 5' end sequence belongs to the relevant digestive system antigen.

[086] The present invention also relates to vectors or plasmids, which include such DNA sequences, as well as the use of the DNA sequences. The material deposited with the ATCC (deposited with the ATCC on October 5, 2000, and receiving ATCC designation numbers PTA 2574 and PTA 2575; deposited with the ATCC on January 5, 2001, having the depositor reference numbers TS-1, TS-2, AC-1, and AC-2; and/or as set forth, for example, in Table 1A, 6 and 7) is a mixture of cDNA clones derived from a variety of human tissue and cloned in either a plasmid vector or a phage vector, as shown, for example, in Table 7. These deposits are referred to as "the deposits" herein. The tissues from which some of the clones were derived are listed in Table 7, and the vector in which the corresponding cDNA is contained is also indicated in Table 7. The deposited material includes cDNA clones corresponding to SEQ ID NO:X described, for example, in Table 1A (Clone ID NO:Z). A clone which is isolatable from the ATCC Deposits by use of a sequence listed as SEQ ID NO:X, may include the entire coding region of a human gene or in other cases such clone may include a substantial portion of the coding region of a human gene. Furthermore,

although the sequence listing may in some instances list only a portion of the DNA sequence in a clone included in the ATCC Deposits, it is well within the ability of one skilled in the art to sequence the DNA included in a clone contained in the ATCC Deposits by use of a sequence (or portion thereof) described in, for example Tables 1A or 2 by procedures hereinafter further described, and others apparent to those skilled in the art.

[087] Also provided in Table 7 is the name of the vector which contains the cDNA clone. Each vector is routinely used in the art. The following additional information is provided for convenience.

[088] Vectors Lambda Zap (U.S. Patent Nos. 5,128,256 and 5,286,636), Uni-Zap XR (U.S. Patent Nos. 5,128,256 and 5,286,636), Zap Express (U.S. Patent Nos. 5,128,256 and 5,286,636), pBluescript (pBS) (Short, J. M. et al., *Nucleic Acids Res.* 16:7583-7600 (1988); Alting-Mees, M. A. and Short, J. M., *Nucleic Acids Res.* 17:9494 (1989)) and pBK (Alting-Mees, M. A. et al., *Strategies* 5:58-61 (1992)) are commercially available from Stratagene Cloning Systems, Inc., 11011 N. Torrey Pines Road, La Jolla, CA, 92037. pBS contains an ampicillin resistance gene and pBK contains a neomycin resistance gene. Phagemid pBS may be excised from the Lambda Zap and Uni-Zap XR vectors, and phagemid pBK may be excised from the Zap Express vector. Both phagemids may be transformed into *E. coli* strain XL-1 Blue, also available from Stratagene.

[089] Vectors pSport1, pCMVSport 1.0, pCMVSport 2.0 and pCMVSport 3.0, were obtained from Life Technologies, Inc., P. O. Box 6009, Gaithersburg, MD 20897. All Sport vectors contain an ampicillin resistance gene and may be transformed into *E. coli* strain DH10B, also available from Life Technologies. See, for instance, Gruber, C. E., et al., *Focus* 15:59- (1993). Vector lafmid BA (Bento Soares, Columbia University, New York, NY) contains an ampicillin resistance gene and can be transformed into *E. coli* strain XL-1 Blue. Vector pCR<sup>®</sup>2.1, which is available from Invitrogen, 1600 Faraday Avenue, Carlsbad, CA 92008, contains an ampicillin resistance gene and may be transformed into *E. coli* strain DH10B, available from Life Technologies. See, for instance, Clark, J. M., *Nuc. Acids Res.* 16:9677-9686 (1988) and Mead, D. et al., *Bio/Technology* 9: (1991).

- [090] The present invention also relates to the genes corresponding to SEQ ID NO:X, SEQ ID NO:Y, and/or the deposited clone (Clone ID NO:Z). The corresponding gene can be isolated in accordance with known methods using the sequence information disclosed herein. Such methods include preparing probes or primers from the disclosed sequence and identifying or amplifying the corresponding gene from appropriate sources of genomic material.
- [091] Also provided in the present invention are allelic variants, orthologs, and/or species homologs. Procedures known in the art can be used to obtain full-length genes, allelic variants, splice variants, full-length coding portions, orthologs, and/or species homologs of digestive system associated genes corresponding to SEQ ID NO:X or the complement thereof, polypeptides encoded by SEQ ID NO:X or the complement thereof, and/or the cDNA contained in Clone ID NO:Z, using information from the sequences disclosed herein or the clones deposited with the ATCC. For example, allelic variants and/or species homologs may be isolated and identified by making suitable probes or primers from the sequences provided herein and screening a suitable nucleic acid source for allelic variants and/or the desired homologue.
- [092] The polypeptides of the invention can be prepared in any suitable manner. Such polypeptides include isolated naturally occurring polypeptides, recombinantly produced polypeptides, synthetically produced polypeptides, or polypeptides produced by a combination of these methods. Means for preparing such polypeptides are well understood in the art.
- [093] The polypeptides may be in the form of the secreted protein, including the mature form, or may be a part of a larger protein, such as a fusion protein (see below). It is often advantageous to include an additional amino acid sequence which contains secretory or leader sequences, pro-sequences, sequences which aid in purification, such as multiple histidine residues, or an additional sequence for stability during recombinant production.
- [094] The polypeptides of the present invention are preferably provided in an isolated form, and preferably are substantially purified. A recombinantly produced version of a polypeptide, including the secreted polypeptide, can be substantially purified using techniques described herein or otherwise known in the art, such as, for example, by the one-step method described in Smith and Johnson, Gene 67:31-40 (1988).

Polypeptides of the invention also can be purified from natural, synthetic or recombinant sources using techniques described herein or otherwise known in the art, such as, for example, antibodies of the invention raised against the digestive system polypeptides of the present invention in methods which are well known in the art.

[095] The present invention provides a polynucleotide comprising, or alternatively consisting of, the nucleic acid sequence of SEQ ID NO:X, and/or the cDNA sequence contained in Clone ID NO:Z. The present invention also provides a polypeptide comprising, or alternatively, consisting of, the polypeptide sequence of SEQ ID NO:Y, a polypeptide encoded by SEQ ID NO:X or a complement thereof, a polypeptide encoded by the cDNA contained in Clone ID NO:Z, and/or the polypeptide sequence encoded by a nucleotide sequence in SEQ ID NO:B as defined in column 6 of Table 1B. Polynucleotides encoding a polypeptide comprising, or alternatively consisting of the polypeptide sequence of SEQ ID NO:Y, a polypeptide encoded by SEQ ID NO:X, a polypeptide encoded by the cDNA contained in Clone ID NO:Z and/or a polypeptide sequence encoded by a nucleotide sequence in SEQ ID NO:B as defined in column 6 of Table 1B are also encompassed by the invention. The present invention further encompasses a polynucleotide comprising, or alternatively consisting of, the complement of the nucleic acid sequence of SEQ ID NO:X, a nucleic acid sequence encoding a polypeptide encoded by the complement of the nucleic acid sequence of SEQ ID NO:X, and/or the cDNA contained in Clone ID NO:Z.

[096] Moreover, representative examples of polynucleotides of the invention comprise, or alternatively consist of, one, two, three, four, five, six, seven, eight, nine, ten, or more of the sequences delineated in Table 1B column 6, or any combination thereof. Additional, representative examples of polynucleotides of the invention comprise, or alternatively consist of, one, two, three, four, five, six, seven, eight, nine, ten, or more of the complementary strand(s) of the sequences delineated in Table 1B column 6, or any combination thereof. In further embodiments, the above-described polynucleotides of the invention comprise, or alternatively consist of, sequences delineated in Table 1B, column 6, and have a nucleic acid sequence which is different from that of the BAC fragment having the sequence disclosed in SEQ ID NO:B (see Table 1B, column 5). In additional embodiments, the above-described polynucleotides of the invention comprise, or alternatively consist of, sequences delineated in Table

1B, column 6, and have a nucleic acid sequence which is different from that published for the BAC clone identified as BAC ID NO:A (see Table 1B, column 4). In additional embodiments, the above-described polynucleotides of the invention comprise, or alternatively consist of, sequences delineated in Table 1B, column 6, and have a nucleic acid sequence which is different from that contained in the BAC clone identified as BAC ID NO:A (see Table 1B, column 4). Polypeptides encoded by these polynucleotides, other polynucleotides that encode these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention. Additionally, fragments and variants of the above-described polynucleotides and polypeptides are also encompassed by the invention.

[097] Further, representative examples of polynucleotides of the invention comprise, or alternatively consist of, one, two, three, four, five, six, seven, eight, nine, ten, or more of the sequences delineated in column 6 of Table 1B which correspond to the same Clone ID NO:Z (see Table 1B, column 1), or any combination thereof. Additional, representative examples of polynucleotides of the invention comprise, or alternatively consist of, one, two, three, four, five, six, seven, eight, nine, ten, or more of the complementary strand(s) of the sequences delineated in column 6 of Table 1B which correspond to the same Clone ID NO:Z (see Table 1B, column 1), or any combination thereof. In further embodiments, the above-described polynucleotides of the invention comprise, or alternatively consist of, sequences delineated in column 6 of Table 1B which correspond to the same Clone ID NO:Z (see Table 1B, column 1) and have a nucleic acid sequence which is different from that of the BAC fragment having the sequence disclosed in SEQ ID NO:B (see Table 1B, column 5). In additional embodiments, the above-described polynucleotides of the invention comprise, or alternatively consist of, sequences delineated in column 6 of Table 1B which correspond to the same Clone ID NO:Z (see Table 1B, column 1) and have a nucleic acid sequence which is different from that published for the BAC clone identified as BAC ID NO:A (see Table 1B, column 4). In additional embodiments, the above-described polynucleotides of the invention comprise, or alternatively consist of, sequences delineated in column 6 of Table 1B which correspond to the same Clone ID NO:Z (see Table 1B, column 1) and have a nucleic acid sequence which is different from that contained in the BAC clone identified as BAC ID NO:A (see Table 1B,



column 4). Polypeptides encoded by these polynucleotides, other polynucleotides that encode these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention. Additionally, fragments and variants of the above-described polynucleotides and polypeptides are also encompassed by the invention.

[098] Further, representative examples of polynucleotides of the invention comprise, or alternatively consist of, one, two, three, four, five, six, seven, eight, nine, ten, or more of the sequences delineated in column 6 of Table 1B which correspond to the same contig sequence identifier SEQ ID NO:X (see Table 1B, column 2), or any combination thereof. Additional, representative examples of polynucleotides of the invention comprise, or alternatively consist of, one, two, three, four, five, six, seven, eight, nine, ten, or more of the complementary strand(s) of the sequences delineated in column 6 of Table 1B which correspond to the same contig sequence identifier SEQ ID NO:X (see Table 1B, column 2), or any combination thereof. In further embodiments, the above-described polynucleotides of the invention comprise, or alternatively consist of, sequences delineated in column 6 of Table 1B which correspond to the same contig sequence identifier SEQ ID NO:X (see Table 1B, column 2) and have a nucleic acid sequence which is different from that of the BAC fragment having the sequence disclosed in SEQ ID NO:B (see Table 1B, column 5). In additional embodiments, the above-described polynucleotides of the invention comprise, or alternatively consist of, sequences delineated in column 6 of Table 1B which correspond to the same contig sequence identifier SEQ ID NO:X (see Table 1B, column 2) and have a nucleic acid sequence which is different from that published for the BAC clone identified as BAC ID NO:A (see Table 1B, column 4). In additional embodiments, the above-described polynucleotides of the invention comprise, or alternatively consist of, sequences delineated in column 6 of Table 1B which correspond to the same contig sequence identifier SEQ ID NO:X (see Table 1B, column 2) and have a nucleic acid sequence which is different from that contained in the BAC clone identified as BAC ID NO:A (See Table 1B, column 4). Polypeptides encoded by these polynucleotides, other polynucleotides that encode these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention. Additionally, fragments and variants of the above-described polynucleotides and polypeptides are also encompassed by the invention.

[0099] Moreover, representative examples of polynucleotides of the invention comprise, or alternatively consist of, one, two, three, four, five, six, seven, eight, nine, ten, or more of the sequences delineated in the same row of Table 1B column 6, or any combination thereof. Additional, representative examples of polynucleotides of the invention comprise, or alternatively consist of, one, two, three, four, five, six, seven, eight, nine, ten, or more of the complementary strand(s) of the sequences delineated in the same row of Table 1B column 6, or any combination thereof. In preferred embodiments, the polynucleotides of the invention comprise, or alternatively consist of, one, two, three, four, five, six, seven, eight, nine, ten, or more of the complementary strand(s) of the sequences delineated in the same row of Table 1B column 6, wherein sequentially delineated sequences in the table (i.e. corresponding to those exons located closest to each other) are directly contiguous in a 5' to 3' orientation. In further embodiments, above-described polynucleotides of the invention comprise, or alternatively consist of, sequences delineated in the same row of Table 1B, column 6, and have a nucleic acid sequence which is different from that of the BAC fragment having the sequence disclosed in SEQ ID NO:B (see Table 1B, column 5). In additional embodiments, the above-described polynucleotides of the invention comprise, or alternatively consist of, sequences delineated in the same row of Table 1B, column 6, and have a nucleic acid sequence which is different from that published for the BAC clone identified as BAC ID NO:A (see Table 1B, column 4). In additional embodiments, the above-described polynucleotides of the invention comprise, or alternatively consist of, sequences delineated in the same row of Table 1B, column 6, and have a nucleic acid sequence which is different from that contained in the BAC clone identified as BAC ID NO:A (see Table 1B, column 4). Polypeptides encoded by these polynucleotides, other polynucleotides that encode these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention.

[0100] In additional specific embodiments, polynucleotides of the invention comprise, or alternatively consist of, one, two, three, four, five, six, seven, eight, nine, ten, or more of the sequences delineated in column 6 of Table 1B, and the polynucleotide sequence of SEQ ID NO:X (e.g., as defined in Table 1B, column 2) or fragments or variants thereof. Polypeptides encoded by these polynucleotides, other

polynucleotides that encode these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention.

[0101] In additional specific embodiments, polynucleotides of the invention comprise, or alternatively consist of, one, two, three, four, five, six, seven, eight, nine, ten, or more of the sequences delineated in column 6 of Table 1B which correspond to the same Clone ID NO:Z (see Table 1B, column 1), and the polynucleotide sequence of SEQ ID NO:X (e.g., as defined in Table 1A or 1B) or fragments or variants thereof. In preferred embodiments, the delineated sequence(s) and polynucleotide sequence of SEQ ID NO:X correspond to the same Clone ID NO:Z. Polypeptides encoded by these polynucleotides, other polynucleotides that encode these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention.

[0102] In further specific embodiments, polynucleotides of the invention comprise, or alternatively consist of, one, two, three, four, five, six, seven, eight, nine, ten, or more of the sequences delineated in the same row of column 6 of Table 1B, and the polynucleotide sequence of SEQ ID NO:X (e.g., as defined in Table 1A or 1B) or fragments or variants thereof. In preferred embodiments, the delineated sequence(s) and polynucleotide sequence of SEQ ID NO:X correspond to the same row of column 6 of Table 1B. Polypeptides encoded by these polynucleotides, other polynucleotides that encode these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention.

[0103] In additional specific embodiments, polynucleotides of the invention comprise, or alternatively consist of a polynucleotide sequence in which the 3' 10 polynucleotides of one of the sequences delineated in column 6 of Table 1B and the 5' 10 polynucleotides of the sequence of SEQ ID NO:X are directly contiguous. Nucleic acids which hybridize to the complement of these 20 contiguous polynucleotides under stringent hybridization conditions or alternatively, under lower stringency conditions, are also encompassed by the invention. Polypeptides encoded by these polynucleotides and/or nucleic acids, other polynucleotides and/or nucleic acids that encode these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention. Additionally, fragments and variants of the above-described polynucleotides, nucleic acids, and polypeptides are also encompassed by the invention.

[0104] In additional specific embodiments, polynucleotides of the invention comprise, or alternatively consist of, a polynucleotide sequence in which the 3' 10 polynucleotides of one of the sequences delineated in column 6 of Table 1B and the 5' 10 polynucleotides of a fragment or variant of the sequence of SEQ ID NO:X are directly contiguous. Nucleic acids which hybridize to the complement of these 20 contiguous polynucleotides under stringent hybridization conditions or alternatively, under lower stringency conditions, are also encompassed by the invention. Polypeptides encoded by these polynucleotides and/or nucleic acids, other polynucleotides and/or nucleic acids encoding these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention. Additionally, fragments and variants of the above-described polynucleotides, nucleic acids, and polypeptides are also encompassed by the invention.

[0105] In specific embodiments, polynucleotides of the invention comprise, or alternatively consist of, a polynucleotide sequence in which the 3' 10 polynucleotides of the sequence of SEQ ID NO:X and the 5' 10 polynucleotides of the sequence of one of the sequences delineated in column 6 of Table 1B are directly contiguous. Nucleic acids which hybridize to the complement of these 20 contiguous polynucleotides under stringent hybridization conditions or alternatively, under lower stringency conditions, are also encompassed by the invention. Polypeptides encoded by these polynucleotides and/or nucleic acids, other polynucleotides and/or nucleic acids encoding these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention. Additionally, fragments and variants of the above-described polynucleotides, nucleic acids, and polypeptides are also encompassed by the invention.

[0106] In specific embodiments, polynucleotides of the invention comprise, or alternatively consist of, a polynucleotide sequence in which the 3' 10 polynucleotides of a fragment or variant of the sequence of SEQ ID NO:X and the 5' 10 polynucleotides of the sequence of one of the sequences delineated in column 6 of Table 1B are directly contiguous. Nucleic acids which hybridize to the complement of these 20 contiguous polynucleotides under stringent hybridization conditions or alternatively, under lower stringency conditions, are also encompassed by the invention. Polypeptides encoded by these polynucleotides and/or nucleic acids, other

polynucleotides and/or nucleic acids encoding these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention. Additionally, fragments and variants of the above-described polynucleotides, nucleic acids, and polypeptides, are also encompassed by the invention.

[0107] In further specific embodiments, polynucleotides of the invention comprise, or alternatively consist of, a polynucleotide sequence in which the 3' 10 polynucleotides of one of the sequences delineated in column 6 of Table 1B and the 5' 10 polynucleotides of another sequence in column 6 are directly contiguous. Nucleic acids which hybridize to the complement of these 20 contiguous polynucleotides under stringent hybridization conditions or alternatively, under lower stringency conditions, are also encompassed by the invention. Polypeptides encoded by these polynucleotides and/or nucleic acids, other polynucleotides and/or nucleic acids encoding these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention. Additionally, fragments and variants of the above-described polynucleotides, nucleic acids, and polypeptides are also encompassed by the invention.

[0108] In specific embodiments, polynucleotides of the invention comprise, or alternatively consist of, a polynucleotide sequence in which the 3' 10 polynucleotides of one of the sequences delineated in column 6 of Table 1B and the 5' 10 polynucleotides of another sequence in column 6 corresponding to the same Clone ID NO:Z (see Table 1B, column 1) are directly contiguous. Nucleic acids which hybridize to the complement of these 20 lower stringency conditions, are also encompassed by the invention. Polypeptides encoded by these polynucleotides and/or nucleic acids, other polynucleotides and/or nucleic acids encoding these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention. Additionally, fragments and variants of the above-described polynucleotides, nucleic acids, and polypeptides are also encompassed by the invention.

[0109] In specific embodiments, polynucleotides of the invention comprise, or alternatively consist of, a polynucleotide sequence in which the 3' 10 polynucleotides of one sequence in column 6 corresponding to the same contig sequence identifier SEQ ID NO:X (see Table 1B, column 2) are directly contiguous. Nucleic acids which hybridize to the complement of these 20 contiguous polynucleotides under stringent

hybridization conditions or alternatively, under lower stringency conditions, are also encompassed by the invention. Polypeptides encoded by these polynucleotides and/or nucleic acids, other polynucleotides and/or nucleic acids encoding these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention. Additionally, fragments and variants of the above-described polynucleotides, nucleic acids, and polypeptides are also encompassed by the invention.

[0110] In specific embodiments, polynucleotides of the invention comprise, or alternatively consist of a polynucleotide sequence in which the 3' 10 polynucleotides of one of the sequences delineated in column 6 of Table 1B and the 5' 10 polynucleotides of another sequence in column 6 corresponding to the same row are directly contiguous. In preferred embodiments, the 3' 10 polynucleotides of one of the sequences delineated in column 6 of Table 1B is directly contiguous with the 5' 10 polynucleotides of the next sequential exon delineated in Table 1B, column 6. Nucleic acids which hybridize to the complement of these 20 contiguous polynucleotides under stringent hybridization conditions or alternatively, under lower stringency conditions, are also encompassed by the invention. Polypeptides encoded by these polynucleotides and/or nucleic acids, other polynucleotides and/or nucleic acids encoding these polypeptides, and antibodies that bind these polypeptides are also encompassed by the invention. Additionally, fragments and variants of the above-described polynucleotides, nucleic acids, and polypeptides are also encompassed by the invention.

[0111] Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. Accordingly, for each contig sequence (SEQ ID NO:X) listed in the third column of Table 1A, preferably excluded are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 and the final nucleotide minus 15 of SEQ ID NO:X, b is an integer of 15 to the final nucleotide of SEQ ID NO:X, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:X, and where b is greater than or equal to a + 14. More specifically, preferably excluded are one or more polynucleotides

comprising a nucleotide sequence described by the general formula of a-b, where a and b are integers as defined in columns 4 and 5, respectively, of Table 3. In specific embodiments, the polynucleotides of the invention do not consist of at least one, two, three, four, five, ten, or more of the specific polynucleotide sequences referenced by the Genbank Accession No. as disclosed in column 6 of Table 3 (including for example, published sequence in connection with a particular BAC clone). In further embodiments, preferably excluded from the invention are the specific polynucleotide sequence(s) contained in the clones corresponding to at least one, two, three, four, five, ten, or more of the available material having the accession numbers identified in the sixth column of this Table (including for example, the actual sequence contained in an identified BAC clone). In no way is this listing meant to encompass all of the sequences which may be excluded by the general formula, it is just a representative example. All references available through these accessions are hereby incorporated by reference in their entirety.

### TABLE 3

| Clone ID<br>NO: Z | SEQ<br>ID<br>NO: X | Contig<br>ID: | EST Disclaimer<br>Range of a Range of b |          | Accession #'s   |
|-------------------|--------------------|---------------|---|----------|---|
| H2CBG54           | 11                 | 893910        | 1 - 629                                 | 15 - 643 | AA088716, AA307227, C16984, C18376, N39732, AA883812, and AB031478.   |
| H2MBV93           | 12                 | 686344        | 1 - 482                                 | 15 - 496 | AA315111.   |
| HALSC22           | 13                 | 503082        | 1 - 323                                 | 15 - 337 | AA358037, A1684486, W19887, AA284345, and AA385699.   |
| HALSE71           | 14                 | 509638        | 1 - 133                                 | 15 - 147 |   |
| HALSG01           | 15                 | 500834        | 1 - 330                                 | 15 - 344 |   |
| HALSH86           | 16                 | 501004        | 1 - 191                                 | 15 - 205 |   |
| HALSJ15           | 17                 | 501008        | 1 - 262                                 | 15 - 276 | AI432133.   |
| HALSK15           | 18                 | 501003        | 1 - 626                                 | 15 - 640 | AA344831, R06460, H60423, AR036570, U90544, AR036572, and U91328.   |
| HALSL45           | 19                 | 723542        | 1 - 467                                 | 15 - 481 | N51075, AA568306, N51117, AA708939, N51516, and AA570794.   |
| HALSN27           | 20                 | 509759        | 1 - 306                                 | 15 - 320 |   |
| HALSN49           | 21                 | 971590        | 1 - 205                                 | 15 - 219 |   |
| HBAAE56           | 22                 | 953244        | 1 - 153                                 | 15 - 167 | AL119457, AL119399, AL042544, AL119324, AI874228, AL048427, AL043168, AL119511, AL079794, AL042382, AL134999, AI538564, AL043152, AI280670, AI872074, AI608805, AI571000, AI745485, AW080856, AI433037, AI251830, AI799199, AI349598, AW269097, AI309443, AI564602, AL049053, AW079736, AI590997, AA761557, AI537735, AI474137, AI921057, AW104196, AI634221, AW089572, AA603709, AI828714, AI890057, AI863477, AI690946, AI890806, AA641818, AI343091, AI598061, AI364788, AI434741, AL045500, AI636719, AI680457, AI866741, AW071362, AW301300, AI348917, AI343059, AW161202, AI343037, AI270561, AI872051, AI349933, AW192375, AI307543, AI307210, AA715307, AW129271, AA809974, AI340659, AI345253, AI799195, AI345005, AI311892, AI307736, AA748353, AI349266, AW051059, AI798258, AI636581, AW059713, AA494167, AI800152, AL045421, AW168402, AI689420, AA830821, AI433157, |



|   |  |  |  |  |  |
|---|--|--|--|--|--|
| AI648567, AI554821, AI434274, AW151136, AW151979, AI590635, AI539771, AW002174, AW168723, AI432644, AI636619, AA468418, AI537677, AI494201, AW263804, AW083804, AI824444, AI890907, AL038864, AI500659, AI866465, AI815232, AI345315, AI801325, AI500523, AI886022, AI538850, AW082600, AI887775, AI582932, AI284517, AI923989, AI872423, AI590043, AI500706, AI610667, AI568060, AI445237, AI491776, AI536910, AW151138, AW088144, AI521560, AI889189, AI866002, AI500662, AI539800, AW172723, AI582912, AI284509, AI889168, AI440263, AI538885, AI886594, AI866573, AI633493, AI434256, AI273179, AI866469, AI636788, AI805769, AI434242, AI888661, AW191003, AI284513, AI500714, AI888118, AW131989, AI972109, AI285439, AI436429, AI859991, AI623736, AI889147, AI355779, AI371228, AI581033, AI440252, AI491710, AL047422, AI783861, AI866786, AI610557, AI860003, AI242736, AI589267, AI828574, AI761489, AI863256, AI874351, AI887499, AI923046, AL046052, AI567978, AI539781, AI539707, AI866585, AL048375, AA127461, AI885949, AW089557, AI559957, AI521571, AI249877, AI469775, AW081255, AI932949, AI282355, AL037030, AL119791, AW084056, AI917963, AI866581, AL040241, AI867042, AI590764, AW059828, AI815150, AA806719, AL037582, AI345111, AL037602, AI446373, AW193467, AL047387, AW268261, AW162194, AI473451, AI752007, AW084097, AI922365, AI473528, AI738852, AI805638, AL046618, AI366549, AI225047, AL038761, AL046595, AI349276, AI345677, AI335363, AL046463, AL046466, AI540606, AI446605, AI348897, AI345224, AL036274, AW191844, AI264741, AI349246, AL048323, AA579232, AI863191, AI671642, AI589428, W60514, AI570384, AA493647, AL037454, AL048340, AI310925, AI334930, AL038605, U77594, Y11587, U49434, AF110329, AI8777, D55641, AF047716, S77771, I48978, L10353, A08916, AL080060, I89947, |  |  |  |  |  |
|---|--|--|--|--|--|

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  |  |  |  | <p> A08913, I89931, A08912, A08910, I49625, A08909, AR038854,<br/> AF012536, A08908, E15569, S76508, I89934, Y08769,<br/> AF113691, AL122110, AL122049, AL133080, AL133081,<br/> AL133077, AL133072, AJ001838, AB014082, AC005057,<br/> AF151109, E07361, AL133619, AF104032, AF081195, E04233,<br/> D83989, X57961, Z99297, AL110197, AR011880, AL137556,<br/> U00686, AL137660, AC004200, AF111112, AF036941,<br/> AL133067, AF113689, E02253, X80340, U96683, AL117629,<br/> AC005291, AL117432, X72889, A93016, AR068751, AP000514,<br/> AF003737, AF113690, AL049339, X87582, E05822, AF132676,<br/> AL049382, AL122106, AF061836, AL137538, M86826, X84990,<br/> J05032, AF162270, AL050149, AF113676, A45787, AL137658,<br/> AL137705, AF030513, AL050138, AR034821, AL137665,<br/> AL110280, AL137537, A18788, AL050277, AL137526,<br/> AR038969, A83556, AL133640, AL049466, AL117583,<br/> AL117585, AL117578, U66274, AF125949, AL133113,<br/> AB029065, S78214, AL122123, AL049300, I09360, AR000496,<br/> U39656, AL050172, AL117460, AF017152, AL117457,<br/> AL137712, AL023657, AL096744, AF158248, U00763, U91329,<br/> AL122121, AL080124, X06146, AL049460, AL080154, X72387,<br/> AC004227, AR059958, U68233, I92592, AL080127, AL035086,<br/> I48979, AL110222, AL137476, A15345, Y10655, S75997,<br/> AF119337, AF113019, AF100931, Y10823, I89944, AF111851,<br/> AL122111, L30117, AL133557, AB007812, AF026124,<br/> AF000301, AL133016, AL137558, AL117440, AF146568,<br/> AL137273, AL080137, AL133565, E02221, I68732, AF113013,<br/> AL137300, AF095901, AB019565, AL110171, AF078844,<br/> AL049464, AL117648, AL133104, AL137429, AF114170,<br/> AL137557, AL133093, AF065135, AR019470, X62580, Z72491,<br/> AF115392, I42402, X00861, AF031147, AF120268, AL049452,<br/> U42031, A90832, E07108, M27260, I66342, AF040751,<br/> AJ010277, S68736, AL133665, AL137527, AL137294,<br/> AF000145, AF182215, I00734, AF026816, AL137276,<br/> AL137463, U75932, X63410, AR020905, AF113694, AF091084,<br/> AL133637, AF017437, AL137283, AF126247, AF113677, </p> |
|--|--|--|--|--|--|

|         |    |        |         |          |  |   |
|---------|----|--------|---------|----------|--|---|
|         |    |        |         |          |  | I96214, AR034830, AF118094, S36676, AF090943, AF097996, AL133558, Y11254, AL137478, U95114, AF051325, X70685, AF069506, AL049314, AF106827, M30514, AF176651, AL137648, AL137459, AL133098, AF079763, AJ242859, II7767, E15324, AJ238278, AL137711, A07647, AL050116, AF058921, AF125948, L31396, E00617, E00717, E00778, AL080140, and U68387. |
| HBAAF58 | 23 | 861603 | 1 - 411 | 15 - 425 |  |   |
| HCLHD88 | 24 | 929223 | 1 - 458 | 15 - 472 |  | AL109839.   |
| HCNAC10 | 25 | 968738 | 1 - 269 | 15 - 283 |  | AA327049, AA327048, AI821708, and AA584428.   |
| HCNAG07 | 26 | 954493 | 1 - 317 | 15 - 331 |  | AA327124, and AA326960.   |
| HCNAK56 | 27 | 832249 | 1 - 243 | 15 - 257 |  | AA327304.   |
| HCNAL66 | 28 | 832247 | 1 - 654 | 15 - 668 |  | AI307359, AI034463, AI831739, AI335097, AA970710, AI003652, AI221942, N52528, AA854422, AI022540, AI301777, and UI0994.   |
| HCNAN69 | 29 | 655816 | 1 - 304 | 15 - 318 |  | AA327349, and AA327350.   |
| HCNAO20 | 30 | 832251 | 1 - 321 | 15 - 335 |  | AA327061, R11625, and H93223.   |
| HCNAR21 | 31 | 948746 | 1 - 418 | 15 - 432 |  | AA327375, and AA327513.   |
| HCNAX26 | 32 | 832250 | 1 - 248 | 15 - 262 |  |   |
| HCNCF73 | 33 | 762056 | 1 - 306 | 15 - 320 |  | AI027472.   |
| HCNCH64 | 34 | 922009 | 1 - 299 | 15 - 313 |  |   |
| HCNCN84 | 35 | 766990 | 1 - 258 | 15 - 272 |  |   |
| HCNCQ46 | 36 | 832349 | 1 - 171 | 15 - 185 |  |   |
| HCNCQ79 | 37 | 832242 | 1 - 503 | 15 - 517 |  | AA327038.   |
| HCNCQ81 | 38 | 887923 | 1 - 119 | 15 - 133 |  |   |
| HCNCU02 | 39 | 918993 | 1 - 251 | 15 - 265 |  | F24030, and AC005971.   |
| HCNCU83 | 40 | 731739 | 1 - 499 | 15 - 513 |  | AC004765.   |
| HCNCV19 | 41 | 832221 | 1 - 438 | 15 - 452 |  | AA327209, and AC008372.   |
| HCNCY39 | 42 | 960373 | 1 - 298 | 15 - 312 |  | AC004874.   |
| HCNDB53 | 43 | 832225 | 1 - 389 | 15 - 403 |  | AA327062.   |
| HCNDD83 | 44 | 832230 | 1 - 259 | 15 - 273 |  |   |
| HCNDF20 | 45 | 669111 | 1 - 245 | 15 - 259 |  |   |
| HCNDG69 | 46 | 666726 | 1 - 387 | 15 - 401 |  | D31061, R70450, and AL080250.   |
| HCNDH18 | 47 | 832215 | 1 - 269 | 15 - 283 |  | AA327490.   |

|         |    |        |          |           |   |
|---------|----|--------|----------|-----------|---|
| HCNDI01 | 48 | 832213 | 1 - 324  | 15 - 338  | AA327395.   |
| HCNDK62 | 49 | 742883 | 1 - 406  | 15 - 420  | AA345691.   |
| HCNDL91 | 50 | 832209 | 1 - 332  | 15 - 346  | AA715255, AA715267, AL048925, AC002091, AC007308, AC002470, AL080243, AL139054, AP000346, AC002544, AL022722, AC003695, Z95152, AC007193, and Y07848.   |
| HCNDN43 | 51 | 832212 | 1 - 286  | 15 - 300  |   |
| HCNDQ50 | 52 | 723976 | 1 - 379  | 15 - 393  |   |
| HCNDV42 | 53 | 927262 | 1 - 417  | 15 - 431  |   |
| HCNSM15 | 54 | 914484 | 1 - 397  | 15 - 411  | H95975, AW392026, AW391990, N31464, and AW365086.   |
| HCNSP37 | 55 | 655829 | 1 - 253  | 15 - 267  |   |
| HCNSQ03 | 56 | 832200 | 1 - 357  | 15 - 371  | AC005046.   |
| HCNUA60 | 57 | 695786 | 1 - 250  | 15 - 264  | R24685, AA469072, AA935534, T50287, AA887381, AI538082, AA809455, AA532665, AA970480, AA833673, AA809439, AA018103, AI419770, AA059058, AA838000, AI654089, AI784506, AA904689, AA575958, AI083552, AI806808, AI261311, AI580662, AA887119, AI268976, AA971980, AI361312, N58823, AA088862, N40196, AA019739, AA906201, AW189948, AW009062, AI188971, AI751250, AI186697, AA610052, AI310126, AI684587, AI189791, AW440198, AW264561, H86494, AI800634, AA886637, T47520, AI971218, H86061, AF113127, AF151877, AL117550, and AF161526. |
| HCNUA84 | 58 | 522523 | 1 - 339  | 15 - 353  | AL035693.   |
| HCQAK31 | 59 | 915563 | 1 - 1178 | 15 - 1192 | AI361034, AW303442, AA587368, AI791894, AI422741, AI026698, AI693765, AI285296, AA576712, AA970211, AI692362, AI355916, AW009839, AI681730, AW376900, AW377010, AA887622, AW376964, AW376895, AA554138, AW377005, AI318042, AW450431, AI821410, AA493362, Z83819, AF127763, AF166328, AF166327, and AF166326.   |
| HCQCR67 | 60 | 974592 | 1 - 662  | 15 - 676  | AI522172, and AW026226.   |
| HCRMC26 | 61 | 913972 | 1 - 731  | 15 - 745  | AI609583, AA805672, AI076486, AW006108, AI708016, AA054347, AA063039, AA430074, AW294990, AA888790, AI014918, N57530, AI221602, AA579954, H91141, AA593129, AI828713, AW130274, AW162983, AI536783, AW163632, AW131695, AA541779, T99047, AW075255, R64176,   |



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| AI539800, AI860003, AL045620, AI627988, AI559619, AI401697, AI88575, AI273179, AA001397, AI686808, AA115869, AW084797, AL045619, AA864839, AW169618, AI679095, AI580435, AL046473, AI285448, AW090550, AI567971, AW078735, AW161202, AI690480, AW059828, AI696340, AI250646, AW168121, AL121270, AI889191, AI269205, AI064830, AL049382, AL137548, D44497, S36676, AL137479, I48978, AR038854, A07588, AF104032, X83544, X65873, AI8788, E12888, AF060866, AF090934, AF175903, AL049423, AF082526, I89947, A77033, A77035, AL133049, AL110171, Y10936, AF113699, AL096744, M85164, X60786, AR050959, S61953, AF141289, AL050172, U37359, X59812, AL137488, AF076464, Y16645, AL133558, AL137530, I52013, AL137459, AF183393, AF185614, AF177401, AC003686, AL122049, U61971, U61970, AL117585, AF090903, AL050092, L04504, AL137550, AF115410, AR022283, AF111112, AF067790, AL133084, S63521, Y11254, AR012379, X57796, D00174, AF112208, AL080148, AL117435, E08516, X60769, AL049283, I48979, I33392, A76335, Z72491, AF111849, A93914, AL050149, AL122101, Y08616, A21103, AF100931, AF017437, AF118070, AL117416, AF126488, AL137656, AL122093, A08910, AL133559, A08909, X66862, AF090943, AL110196, AL137258, AF079763, AF172400, Y14314, AL049426, AL133061, AL133067, AJ000937, AL080159, X70685, X72624, AL133057, AL080156, M80340, AR068466, AL078630, AC004200, AL137539, A08907, AF068615, AL096728, AF106657, AR034821, AF085809, U35846, AL133112, AR023871, A08913, X63410, AF031903, AL137523, I46765, AL133053, E12580, AL133015, A27171, S77771, AB029066, AR066486, A18777, Y10655, A08908, AL137560, E16086, AL117583, AF131826, AL133075, AF090900, AL137533, AF061981, AL110228, A08912, AL137480, AB029065, AL110280, E06743, AL133637, AR054987, AF031147, A49139, Y07905, AF182215, D16301, E12747, X81464, Y18678, AL137271, U58996, AF159615, AJ238278, |  |  |  |  |
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|         |    |        |          |           | AL137529, U87620, AL133608, AL050155, AL133072, U49908, AL133623, Y13653, A26498, I89931, AF113694, A57389, AF126247, AL137557, I33391, AF080068, AF069506, U37312, AF150103, A03736, AF057300, AF057299, X83508, I68732, AP000083, AL133665, AL133560, I49625, AL122110, AL137526, AL122103, AL049339, E03671, AL133080, X80340, E02349, AF153205, AF044221, AL080234, A93350, E12579, U68387, U62966, AL110226, M64936, E02221, AF079765, AF043642, AJ005690, U88966, AL008706, S78214, I00734, A15345, AF000167, AL117648, AF119337, AB026995, A65341, AL050024, Z82022, AF176651, AL110197, AL122100, AF082324, I30339, I30334, AF026008, AL023657, E00617, and E00717.                       |
| HCRMJ47 | 62 | 919757 | 1 - 525  | 15 - 539  | AB027466, AR035961, and AR035966.   |
| HCRMP18 | 63 | 888719 | 1 - 620  | 15 - 634  | AA853396, and AC005041.   |
| HCRMR08 | 64 | 958489 | 1 - 520  | 15 - 534  |   |
| HCRMR69 | 65 | 877118 | 1 - 370  | 15 - 384  | AI905014, AL040212, and AC005546.   |
| HCRMT41 | 66 | 974324 | 1 - 632  | 15 - 646  | AW392670, U46347, AL043003, AL043147, AL134132, AL042542, AW363220, AW384394, AL119457, AL134531, U46351, AL119324, U46350, and AL119396.   |
| HCRND67 | 67 | 921398 | 1 - 1998 | 15 - 2012 | AI978754, AA648498, AW001743, AI962419, AI446119, AI949312, N40531, AI522273, AA648907, W22178, AA773627, N46577, AI362932, AI214186, AA261979, AA252030, AW024768, AI935656, AW024010, AI416968, AI361764, AI039260, AA521447, AI127900, AI917267, AI761487, AA860961, AI936802, AI351462, AI580311, AI298481, AA931114, N26272, AI680734, AI864624, AW136987, W22807, AA808453, AA904280, N46583, AA131263, AA191430, H89921, AA326409, AI422420, AI189597, AI636058, AI680207, AA344413, AI767707, AA628794, AI312828, AW262532, AA860568, AA804488, N45139, AA574232, AI694810, T71336, AA251892, AI948498, AA364681, H91961, W22678, W22611, AA829581, T71491, H99173, N40538, and AC005325. |
| HCRNF63 | 68 | 916063 | 1 - 588  | 15 - 602  | AA424352, AW297467, AI873546, and AI799462.   |
| HCRNH81 | 69 | 914840 | 1 - 625  | 15 - 639  | AW250326, C17590, AI278478, AW407305, AI278479,   |

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| HCRNI04 | 70 | 849408 | 1 - 523 | 15 - 537 | AA128411, AW391907, W26388, R17779, and R17794, W96062, and W96061.   |
| HCRNK95 | 71 | 890458 | 1 - 339 | 15 - 353 | AA081839, AA310355, AA155876, H14728, Z45712, H18048, W67980, AA377062, H78474, H94833, AA359982, AA864236, F07871, N73165, N31384, H24503, AA504292, H25657, AA252782, F06229, AA309562, R52876, AI500636, and AL050265.   |
| HCROE42 | 72 | 950701 | 1 - 878 | 15 - 892 | AI701141, AW058533, AI458893, AW070453, AI435242, AI671435, AA912665, AI341202, AI243346, AW292434, AI373882, AI859938, AI203340, AI079549, AW167705, H05453, AI183877, AA737049, AI023804, AI831537, AI989594, N45293, AF142992, AF184344, AF177201, U94703, AF177202, and AF006072.   |
| HCROM08 | 73 | 974135 | 1 - 330 | 15 - 344 | AL134524, AL119511, AL043152, AI431323, AL043168, AI432644, AI431307, AI431316, AL042853, AI431238, AI623302, AI866581, AI815239, AI432666, AI866786, AI567971, AI927233, AI440238, AI866465, AI494201, AW151974, AI500659, AI815232, AI801325, AI500523, AI538850, AI887775, AI582932, AI923989, AI590043, AI872423, AI284517, AI500706, AI445237, AI491776, AI289791, AW151138, AI889189, AI521560, AI500662, AI539800, AW172723, AI284509, AI582912, AI538885, AI440263, AI889168, AI866573, AI633493, AI434256, AI866469, AI805769, AI434242, AI888661, AI500714, AI284513, AI888118, AI285439, AI859991, AI436429, AI355779, AI889147, AI623736, AI581033, AI371228, AI491710, AI440252, AI860003, AI610557, AI431321, AI242736, AI828574, AI887499, AI539781, AI702065, AI539707, AI885949, AI285419, AW089557, AI559957, AI521571, AI537677, AI469775, AI804505, AI567953, AI815150, AI446495, AI866691, AI867068, AI952433, AI926593, AI285417, AI890907, AI432653, AI282249, AL042655, AI440260, AI955441, AI539260, AL042533, AW074057, AI225248, AI698352, AL043166, AI371229, AI358271, AL042787, AI432656, AL047611, AW151132, |



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|         |    |        |         |          | <p>AI924051, AL042729, AW058275, AI888575, AI431315, AW081103, AL042515, AI539771, AI889191, AL042944, AI798359, AI888317, AL039390, AI282247, AL135012, AW151136, AI872315, AL042508, AI521465, AI561170, AI863197, AI690946, AL042931, AI648567, AI355008, AI433157, AI932620, AL039287, AI521596, AL046681, AI493559, AI371243, AL042981, AI469764, AI963849, AI446536, AL043091, AI285432, AL045166, AW194509, AW197139, AL043021, AI539863, AI366900, AI275175, AI963463, AW151970, AI366910, AL042488, AI582926, AI355017, AI521551, AI469754, AI499463, AL042551, AI371237, AI610362, AI885920, AI440239, AL046356, AI537273, AI537191, AI436456, AI371265, AI963846, AI567940, AL046137, AI610357, AI817244, AW151131, AI612913, AI285826, AI863014, AI521594, AI355765, AI499512, AI889133, AI538881, AI805774, AI499508, AI499483, AI282268, AI923061, AI923446, AL043089, AI537943, AW087954, AI434255, AI434223, AI697243, AI610429, AI434222, AI628850, AI284515, AI284516, AI433968, AL133074, AL133049, AL133076, AL133053, AL122101, and Y17793.</p> |
| HCRON75 | 74 | 922386 | 1 - 186 | 15 - 200 | <p>AA040586, AI015787, AA938464, AA479214, AI282749, AA452413, AI799916, AA995903, AA902306, AW005485, AI302646, AA730505, AW192311, AW273459, AI868755, AI084500, AA182799, AI418984, AI278335, AA017529, AI241303, AA432193, AI004146, AW341825, AI400390, T40774, AI803455, W02777, AA354898, AI038039, AI469768, AI934274, AA013109, AI537782, AA877238, H07058, T48214, AA978013, AI911851, AA776891, AW304390, AW006644, N75836, AI084476, AA232952, AA479122, AI932697, AW196023, AI208222, F04445, F01828, AI130678, AW190128, T40963, AA644390, AA058919, AI122868, AI087324, AA369059, AA243728, AI561065, AI921425, AI828356, AA057173, N35151, AI597644, AI336533, AI620708, AA235996, N23222, AI816733, W60616, AA587281, AA954671, AI859497,</p>   |

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| HCROV23 | 75 | 975245 | 1 - 667 | 15 - 681 | AI357056, AW129922, N69671, AI066552, AI434169, AA194995, AA779835, C01287, AA243833, AA418568, AA418584, H43864, AA253056, H53350, R85536, R75653, W24835, AA629185, AA040558, AA789172, AA194809, AA535768, AA479121, and W07476.   |
|         |    |        |         |          | Z99396, AW392670, AW372827, AW384394, AL119457, AL119324, AW363220, AL119497, AL119522, AL036418, AL038837, AL119319, U46351, U46350, AL119341, AL119418, AL037051, AL036725, AA631969, AL119484, AL119391, AL119443, AL119496, AI142131, AL038509, AL119355, AL119483, AL119396, AL119363, U46341, AL037205, U46349, AL119335, AL036858, U46347, AL039074, AL036924, AL119401, AL134525, AL134536, AL119399, AL119444, AL037526, AL119439, AL037094, AL134531, AL037077, AL037639, AL042551, AL134538, AL134902, U46346, AL037082, AL036196, AL039564, AL037085, AL036767, U46345, AL038520, AL036190, AL036268, AL036998, AL036733, AL037615, AL037021, AL036238, AL037027, AL036765, AL036191, AL036679, AL036886, AL036158, AC005822, AR066494, AR060234, A81671, AR023813, AR064707, AB026436, and AR054110. |
| HCROZ66 | 76 | 909686 | 1 - 377 | 15 - 391 | AA172248, AA327978, AA279942, and AL137710.   |
| HCRPT92 | 77 | 931152 | 1 - 893 | 15 - 907 | AA455567, AI459549, AA398062, AA515452, AI394051, AW044341, AA456064, AI699125, AA143102, and AA310438.   |
| HCRPU05 | 78 | 931081 | 1 - 358 | 15 - 372 |   |
| HCRPZ11 | 79 | 973908 | 1 - 623 | 15 - 637 | AL119319, AL042551, AL119418, AL119399, AL042542, AL043011, AL134518, U46341, AL119497, AL119401, AL119439, AL134528, AL042965, AL134538, AL119484, AL119363, AL119391, AL119355, AL119443, AL119483, AL042975, AL042896, AL119464, AL043029, AL039912, AL042544, AL042970, AL119496, AL042984, AL119304, AL043003, AR043113, AB026436, and A81671.   |
| HCRQG35 | 80 | 954968 | 1 - 490 | 15 - 504 | AW102682, AI051040, AI868693, W16730, AL134524, AL134110, AI142134, AL038983, AL037727, AL039643, AL045327, AL045328, AL039432, AL049018, AL047163.   |

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|  |  |  |  | AL037295, AL038838, AL037343, AI547295, AL042898,<br>AL037436, AL037335, AL037323, AL037443, AL038532,<br>AL038822, AL044125, AL037435, AL041347, AL040193,<br>AL043923, AL043814, AL047012, AL041238, AL044186,<br>AL040617, AL043845, AL038761, AL044162, AL040463,<br>AL047170, AL044037, AL041635, AL040294, AL044064,<br>AL041459, AL041577, AL043496, AL047219, AL040576,<br>AL040625, AL040472, AL038651, AL045684, AL041752,<br>AL045753, AL043538, AL040621, AL046850, AL040768,<br>AL046994, AL046914, AL040052, AL041955, AL040444,<br>AL040464, AL040510, AL043467, AL043677, AL040839,<br>AL043492, AL041602, AL044074, AL041730, AL041523,<br>AL043627, AL041374, AL043848, AL043570, AL047183,<br>D29033, AL042135, AL041324, AW372827, AL046442, .<br>AL039360, AL041133, AL046392; AL045671, AL041098,<br>AL039316, AL040322, AL041246, AL040119, AL044272,<br>AL041096, AL044258, AL042096, AL041168, AL041163,<br>AL041159, AL119324, AL045920, AL040148, AL047057,<br>AL041296, AL040075, AL047037, AL037341, AL040458,<br>AL044187, AL048677, AL041358, AL041292, AL041086,<br>AL038745, AL045817, AL045990, AL040571, AW392670,<br>AL041346, AL041142, AL040332, AL039338, AL079878,<br>AL040529, AL079852, AL044199, AL041197, AL046330,<br>AL044274, AL040745, AL041233, AL040370, AL040128,<br>AL040553, AL040149, AL047036, AL040342, AL038878,<br>AL041186, AL040414, AL039744, AL043941, AL041277,<br>AL040285, AI318479, AL037279, AL040155, AL040091,<br>AL044165, AL041131, AL040090, AL045989, AL119484,<br>AL041051, AL040168, AL041344, AL043775, AL119439,<br>Z99396, U46344, AL038024, AL040253, AL119418, AL041227,<br>AL040082, AL036858, AL045857, AL135012, AL119399,<br>AI547291, AL040329, AL119319, AL048714, AL119457,<br>AL048657, AL047340, AW363350, AL134519, AL036767,<br>AL119391, AL037094, AL134530, AL119443, AL036196,<br>AW384394, AL119522, U46350, AL041278, U46347, AL043444, |
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|         |    |        |         |          | AL045494, AW363220, AL119497, AL042523, AL042544, AL119363, U46351, AL036190, U46349, AL119483, AL119355, AL036773, AL040263, U46341, AL038851, AL036418, AL038837, AL119341, AL119335, AL119396, AL040238, AL119444, AL037639, AL119496, AL037051, AL036725, AI547258, AA631969, AL042420, AL042468, AL040255, AL037205, AL038040, AL045725, AL119464, AL134528, AR066494, AR064707, AI238010, AR023813, DI7247, A93923, A93916, AR060234, A81671, A93931, A85203, AB026436, AL133053, AR069079, AR054110, AL122101, and AR043113.   |
| HDDAD23 | 81 | 967714 | 1 - 198 | 15 - 212 |   |
| HDDAF44 | 82 | 715802 | 1 - 550 | 15 - 564 | H00541, W04294, AA909195, and AF055378.   |
| HDRMA28 | 83 | 841936 | 1 - 316 | 15 - 330 | AI584176, AA024443, AA161492, H65697, H38769, T90477, AW236288, AI343169, AI364568, AA632907, AI719298, AW085811, AI735200, AI866580, AA586667, AC007676, AC007388, AC004983, AC006597, AC004796, AC007687, AL035072, AC005280, AL021939, AL021391, AC004526, AC004531, AC004491, AC004963, AL022476, AC005952, AL031577, AC005365, AL035695, AC005779, AC004381, AC003041, AC007666, AC005562, AL022398, AC004019, AC005412, Z84469, AC007878, AL109963, AL080317, AF196969, AL020997, AB023048, AP000689, AC004883, AC006141, AC009247, AC005095, AL133448, AC002350, AL050317, AF047825, AL034410, AP000501, AC005940, AP000555, AC005180, AC005026, AC002425, AC005071, AC006121, AC005531, AC006006, U62293, U63721, AP000133, AP000211, Z98742, AC006372, AC006455, AC006946, AC005701, AC005844, AC005057, AL079295, AL022067, AL117354, AC006538, AC007435, AC008115, AC007057, AC002538, AL139054, AL049872, AC004841, AP000356, Z95113, AP000563, Z83843, AL023284, AC006023, Z94161, AL049795, AC009248, AC005081, AF029308, AC004910, AR036572, U91328, AB003151, AL034400, AC005237, AC006323, AF064861, AC005529, AC005971, AL049778, AC007436, AL121658, AL121603, AC004386, AC006478, |

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|         |    |        |         |          | AC005288, AC016025, AL034549, Z97205, AF111168, Z93930, AL034548, AC004859, Z98941, AC008372, AC002476, Z99943, AL133353, Z97054, AC002558, AC007510, AL033397, AL121655, AC004653, AL035086, AF196971, Z98051, AL031667, AL117355, AC007686, AC004217, AC002542, AL034429, AC004216, AC007055, AL132777, AL136295, AC007790, AC004783, AF165926, AP000116, AP000112, Z85986, AC006211, AC005876, AL096701, AC007283, AL009051, AL031005, AC007308, AL109984, AC003108, AC005740, AC005031, AC005632, AC005482, AP000221, AC002470, AC002400, AC005924, AL024493, AC006084, AC003007, AC007934, AC002492, AF001549, AC006285, AL121653, AL121754, M55987, AL096761, AC005754, AF172277, Z83840, AC007688, AL049779, Z95116, AC000120, AC004975, AC004912, AC000090, AC004985, AC007193, AL078581, AP000115, AC005291, AC004099, AC007051, AC004765, AC007564, AL035464, Z85996, AL035419, AC005899, AC008009, AL080243, AC007192, AL009172, AC006088, AC004797, Z93017, AC007225, AC005666, AC008012, AJ246003, AC004858, Z95114, AL049757, and Z81010. |
| HDRMB41 | 84 | 691662 | 1 - 311 | 15 - 325 |   |
| HDRME31 | 85 | 697523 | 1 - 380 | 15 - 394 | AL137191.   |
| HDRMF01 | 86 | 915726 | 1 - 206 | 15 - 220 |   |
| HEPND10 | 87 | 963559 | 1 - 612 | 15 - 626 |   |
| HFLNA59 | 88 | 537447 | 1 - 305 | 15 - 319 | AC002302.   |
| HFLQA82 | 89 | 757380 | 1 - 126 | 15 - 140 | AI075922, AI809982, AI381501, N51297, and AA937353.   |
| HFLQF55 | 90 | 719018 | 1 - 976 | 15 - 990 | Z43436, H59905, R12032, and D80088.   |
| HFLSF55 | 91 | 955305 | 1 - 388 | 15 - 402 |   |
| HFLSH67 | 92 | 968639 | 1 - 350 | 15 - 364 | AI299693, AA883901, AI191830, N55520, AI092823, AI913666, N77006, AI580351, AA955222, AA723196, AA885796, AA470715, AI311127, AC002312, AC005800, Z68162, AL022326, AB023050, AC007298, AC006006, Z84484, AC007312, AC002544, AC004887, AC004972, L78810, AC006965, Z84476, AL021939, AL049709, AP000031,   |

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| AC008101, U91326, Z83844, AC005046, AC006530, AP000362, Z68226, AL117352, AL049869, AF124523, AC005225, Z81450, AC007376, AC006057, AC006037, AL050321, AC005082, AC002067, AC007617, AB020858, AC005202, AC006387, AC004000, AC007388, AL121756, AC005332, AF146367, AL078463, AL079306, AC006271, AC002314, Z83826, AB023048, AP000511, AC006029, AP00152, AC000111, AC010200, AP000509, AL034379, AC004087, AC005034, AC008038, AC003029, AC002430, AC004987, AL122003, AL031297, AP000313, AP000253, AC006013, AC007384, AC004668, AC003013, AC002422, AC004212, AL079342, AL031848, AC000385, AL050317, Z93020, AP000050, L78833, AC006991, AC007038, AC007731, AC005500, AC005606, AL078580, AL096802, AC003049, AP000117, Z98941, AC005363, AC004216, AC008275, AL121871, AC016027, Z83820, AC005722, AL078644, AC016830, AC007680, AC006582, AC000048, AC007200, AC004835, AL022146, AC002301, AC005538, AC007068, AL035458, AP000213, AC005924, AC002451, AP000135, AC009241, AF222685, AC006065, AC007625, AP000512, AL109799, AL049778, AC006502, AC005006, AC004168, AL021878, AL035411, AC005539, AP000101, AF130248, AC010197, AL133249, AC006459, AC005378, AC010582, AC004197, AL109754, AP000034, AC009405, AC006998, AC005392, U73627, AC005076, AC006975, Z82975, AC004549, AC004923, AL035687, AC005245, AL035541, AF061779, AL022726, AC008079, AC004823, Z85997, AP000010, AC007106, AL031679, AC002064, AL049780, AC005066, AC006480, AL033525, AL031985, AC007687, AP000083, AC008170, AC005150, AL049832, AC002487, AL023883, AL137100, Z84474, AC004595, Z92547, AL031054, AC005377, Z81365, AC007274, AC005336, AF118808, AL122023, AC007632, AC005069, AC009802, and AL050309. |    |        |         |          |
| HFLSJ23  | 93 | 509743 | 1 - 450 | 15 - 464 |
| HFLSJ61  | 94 | 507017 | 1 - 304 | 15 - 318 |

|          |     |        |         |          |   |
|----------|-----|--------|---------|----------|---|
| HFLSK11  | 95  | 964908 | 1 - 451 | 15 - 465 | AC007845, AC016025, and AC016026.   |
| HFLSK31  | 96  | 535238 | 1 - 416 | 15 - 430 | AI524810, AL031311, AC005288, AF190465, and AC005412.   |
| HFLSK81  | 97  | 761133 | 1 - 401 | 15 - 415 | H05992, AA525518, AL031584, AC005829, and AC002470.   |
| HFLUF43  | 98  | 928026 | 1 - 840 | 15 - 854 | AA341707, AA730474, AL035414, AC002365, AC004973, U82695, AL009172, AL031276, AC005211, AC005356, U07562, AF001548, AC006211, AL122003, U85195, AL031985, AC009516, AF024534, AC005086, AC010170, AC007298, AC007096, AC002119, AL031905, and AC004491. |
| HFLUF44  | 99  | 522416 | 1 - 443 | 15 - 457 | W89038, AI762449, AI887272, AI924601, AW043702, AI800918, AF015308, and AF068007.   |
| HFLUG50  | 100 | 526181 | 1 - 335 | 15 - 349 |   |
| HFLVE61  | 101 | 539872 | 1 - 380 | 15 - 394 | T68764, X14690, X67055, and AC006254.   |
| HFLVE85  | 102 | 531014 | 1 - 362 | 15 - 376 | AB007954.   |
| HFLVI15  | 103 | 921860 | 1 - 429 | 15 - 443 |   |
| HFLVJ52  | 104 | 954506 | 1 - 192 | 15 - 206 |   |
| HFLVBA62 | 105 | 754154 | 1 - 434 | 15 - 448 | AA343433, AI248396, and AF090901.   |
| HFLVG178 | 106 | 935839 | 1 - 255 | 15 - 269 |   |
| HFLVGK74 | 107 | 789130 | 1 - 264 | 15 - 278 |   |
| HFLVHC25 | 108 | 678573 | 1 - 208 | 15 - 222 |   |
| HFLVHE45 | 109 | 572837 | 1 - 514 | 15 - 528 | R24654, and AL031680.   |
| HFLVHE66 | 110 | 572852 | 1 - 306 | 15 - 320 |   |
| HFLVHF81 | 111 | 929124 | 1 - 291 | 15 - 305 | AA346826, and T60555.   |
| HFLVHI01 | 112 | 916970 | 1 - 403 | 15 - 417 |   |
| HFLVHM86 | 113 | 572830 | 1 - 276 | 15 - 290 |   |
| HFLVHT75 | 114 | 573301 | 1 - 380 | 15 - 394 | AA344780.   |
| HFLVTH95 | 115 | 573198 | 1 - 445 | 15 - 459 |   |
| HFLVTH33 | 116 | 871980 | 1 - 365 | 15 - 379 |   |
| HGBAE29  | 117 | 537309 | 1 - 289 | 15 - 303 | AA343751, AA343713, and AA343517.   |
| HGBAH38  | 118 | 503211 | 1 - 115 | 15 - 129 | AA344168, AA343845, and Z98946.   |
| HGBAH80  | 119 | 932630 | 1 - 216 | 15 - 230 | AA343855.   |
| HGBAI39  | 120 | 503055 | 1 - 362 | 15 - 376 | AA343883.   |
| HGBAI42  | 121 | 503057 | 1 - 446 | 15 - 460 | AA345779, AA343729, and AA344370.   |
| HGBAI44  | 122 | 536599 | 1 - 393 | 15 - 407 | AA343730.   |
| HGBAI70  | 123 | 707918 | 1 - 204 | 15 - 218 | AA343886.   |

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|---------|-----|--------|---------|----------|---|
| HGBAK23 | 124 | 500801 | 1 - 246 | 15 - 260 | AA344764, and AA343998.   |
| HGBAM36 | 125 | 509552 | 1 - 284 | 15 - 298 | AA344076, AA344304, AA344477, and AC004168.   |
| HGBAM75 | 126 | 509546 | 1 - 324 | 15 - 338 | AA344134, AA345832, and AA323944.   |
| HGBAN21 | 127 | 509538 | 1 - 308 | 15 - 322 | AA344151, and AA344472.   |
| HGBAO08 | 128 | 854321 | 1 - 206 | 15 - 220 | AA344192, AA345549, W07336, AA564925, and M85967.   |
| HGBAP09 | 129 | 509265 | 1 - 314 | 15 - 328 | AA345977, AA344299, AW386937, and AC006323.   |
| HGBAP42 | 130 | 509262 | 1 - 184 | 15 - 198 | AA344282, and AA345692.   |
| HGBAQ37 | 131 | 500799 | 1 - 266 | 15 - 280 | AA344009, AA344267, and AA344356.   |
| HGBAQ81 | 132 | 509533 | 1 - 210 | 15 - 224 | AA344381, AA344514, and Y14489.   |
| HGBAU10 | 133 | 961242 | 1 - 271 | 15 - 285 | AA344397, AA237018, AA243581, AL079910, AI125886, AL047152, AW194322, W80416, N50796, H78664, AW009157, and H47038.   |
| HGBAU93 | 134 | 625250 | 1 - 293 | 15 - 307 | AA344601, and AA732430.   |
| HGBAZ13 | 135 | 971646 | 1 - 345 | 15 - 359 | AA344553, and AA344444.   |
| HGBBB48 | 136 | 503470 | 1 - 289 | 15 - 303 | AA344888, and AA345014.   |
| HGBBO62 | 137 | 509691 | 1 - 623 | 15 - 637 | N72651, N73115, AA345201, AF192522, and AC004938.   |
| HGBBY74 | 138 | 509641 | 1 - 323 | 15 - 337 |   |
| HGBCH13 | 139 | 508982 | 1 - 292 | 15 - 306 | AA345504, and AA345251.   |
| HGBCU23 | 140 | 508807 | 1 - 307 | 15 - 321 | AA346013.   |
| HGBDB04 | 141 | 961510 | 1 - 375 | 15 - 389 | W44483, AA035386, T35549, AA452722, AA057029, H69070, W32750, H49745, W76429, R72005, T30430, AA148014, W73817, AI080285, AW288085, T34177, AA147986, AA150156, W44484, AI085400, H73233, W72037, H49750, AI066753, N58555, AI826700, T34802, H50333, H46824, AI090058, AI885762, T89164, AI685629, T32128, F36442, AI361072, T35804, H47715, AI139439, AI720442, T34284, AA888074, AW026542, AI860947, H69218, AI363004, T35256, AI582271, T34182, R75697, T25347, N88560, AI744625, H72539, T31812, AA150040, AA579651, T30271, AA047370, T36153, AA782412, AI335748, N78151, T34116, D30929, H69063, AA035385, AA248079, AI761650, AA301051, AA369356, F36921, C05196, AA862651, AA830645, AA431325, AA090035, H72938, H69071, AA579160, AI826369, AW364000, H48067, AI394420, AA669621, F26842, H99978, AA938754, H49513, AI261333, |



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|---------|-----|--------|---------|----------|---|
| HGBDB21 | 142 | 753848 | 1 - 356 | 15 - 370 | C04184, AA862374, AA748804, H74239, AA887224, AI769256, AA568518, AW182004, AI219387, H46745, AA037011, AA669683, R72006, AI220761, F18095, H69064, AI582096, AI150900, AI358853, AA923809, AI184113, AI002474, AI093342, AI367456, AI097516, T63027, AW363987, H50450, AI363806, W32693, AI125944, AI015971, AA972455, AI302031, and H49518. |
| HGBDC48 | 143 | 960971 | 1 - 406 | 15 - 420 | AA534444, and AA344632.   |
| HGBDD52 | 144 | 954496 | 1 - 544 | 15 - 558 | AA345950, AA343937, AA346012, and AA344317.   |
| HGBDE16 | 145 | 533741 | 1 - 464 | 15 - 478 | AI446018, AA343716, T80849, AA344417, AA345708, T80924, and AL049839.   |
| HGBDF61 | 146 | 742234 | 1 - 441 | 15 - 455 | AA568404, AC004106, AL049591, Z98946, and AC005094.   |
| HGBDG59 | 147 | 522932 | 1 - 358 | 15 - 372 | R59319, W25783, T80460, AA345654, and AC006959.   |
| HGBDG69 | 148 | 578390 | 1 - 342 | 15 - 356 |   |
| HGBDH63 | 149 | 732530 | 1 - 257 | 15 - 271 | AA447829, and AL137370.   |
| HGBDI95 | 150 | 509439 | 1 - 319 | 15 - 333 |   |
| HGBDL05 | 151 | 932881 | 1 - 748 | 15 - 762 | AA345826, AA344598, and AL096701.   |
| HGBDL72 | 152 | 710318 | 1 - 362 | 15 - 376 | R91010, AA718934, and AA345915.   |
| HGBDU57 | 153 | 731004 | 1 - 113 | 15 - 127 | AA345940, and AA345679.   |
| HGBDX24 | 154 | 678576 | 1 - 469 | 15 - 483 | AW026322, D44839, and X77631.   |
| HGBDX35 | 155 | 503477 | 1 - 353 | 15 - 367 | AI767326, N51939, AA029906, AA030035, AI242673, AI341053, AA931042, AA877157, AW172418, AW384993, R70208, N46437, and AC004945.   |
| HGBDY02 | 156 | 921081 | 1 - 271 | 15 - 285 | AA343767.   |
| HGBDY30 | 157 | 503476 | 1 - 225 | 15 - 239 |   |
| HGBDY59 | 158 | 815818 | 1 - 442 | 15 - 456 | AA343777, and AC007298.   |
| HGBEY32 | 159 | 971570 | 1 - 295 | 15 - 309 | AI685090, AI904421, E14558, and E14559.   |
| HGBGA29 | 160 | 508433 | 1 - 216 | 15 - 230 | AA343864, and AC005244.   |
| HGBGI54 | 161 | 573764 | 1 - 257 | 15 - 271 | AA345731.   |
| HGBGI57 | 162 | 573752 | 1 - 321 | 15 - 335 | AA345642, AI524488, AI373756, AI498126, AW055308, H21096, AI650514, and AI655067.   |
| HGBGO22 | 163 | 558830 | 1 - 345 | 15 - 359 | AW302143.   |
| HGBGT92 | 164 | 924780 | 1 - 315 | 15 - 329 | T28629, and Z11502.   |

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|---------|-----|--------|---------|----------|---|
| HGBGW04 | 165 | 573644 | 1 - 322 | 15 - 336 | AC006529.   |
| HGBHC35 | 166 | 573687 | 1 - 302 | 15 - 316 | AF039186.   |
| HGBHM09 | 167 | 573673 | 1 - 250 | 15 - 264 |   |
| HGBHN46 | 168 | 573678 | 1 - 228 | 15 - 242 |   |
| HGBHP95 | 169 | 781326 | 1 - 290 | 15 - 304 |   |
| HGBHS11 | 170 | 967385 | 1 - 213 | 15 - 227 |   |
| HGBHY06 | 171 | 937940 | 1 - 434 | 15 - 448 | T87025, AL045919, AI926049, AI826890, AA468860, AA612729, AA654159, AA171760, AW197994, AI272783, AA172001, AI308822, AI674148, AI379842, AI582837, AI89712, AI828370, AI199276, AW188430, AA704757, AA536162, AA573761, and AI300550.  |
| HGBIC81 | 172 | 796500 | 1 - 94  | 15 - 108 |   |
| HGBID55 | 173 | 575197 | 1 - 298 | 15 - 312 | AA344805, AI911569, AA082564, AI003260, AI244141, AI026132, AL034408, AC004038, and AC005702.   |
| HGOCB25 | 174 | 506771 | 1 - 335 | 15 - 349 | AA346046, AA345869, AA468975, AA847499, AI250552, AI251034, AI254770, AI284543, AI054090, AA664126, AA053463, AI251284, AI251203, AI223626, AI249853, N27874, AI734155, AI302350, AA557136, AW303098, AI246061, AA572987, AA487209, AI251241, AI251944, H69661, AA565911, AA468494, AI679294, AW083706, AA601396, AA468956, AW276678, AI076328, AL049761, Z99716, AL022165, AP000689, AB003151, Z98946, AC002404, AC005921, AL021707, AC004129, AC005284, AC000066, AP000022, AF196779, AP000163, AC006130, AJ010770, AC007226, AC002430, AL117340, Z93020, Z95114, AC007384, AF047825, AC007388, AC005180, AL035071, AC007371, U95740, Z99127, AP000117, AL031311, AC007227, AL031584, Z86090, AC006059, AC005071, AC005953, Z84487, AC005280, AC004253, AL031774, AL050318, AC005746, AC004491, AC004966, AL031597, U63721, AC003982, AC007566, AP000704, AC007327, AL109627, AL022326, Z98752, AC003070, Z99129, AL049833, Z84469, AC005081, AL109963, AC006965, AC009248, AL096773, U91323, AC005014, AC005821, AL035405, U95737, AC005736, AC007221, AC006449, AC005696, AC006014, AJ003147, U07563, |

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|         |     |        |         |          | AL022323, AF107885, AL049712, AP000031, AL022336, AL121653, AC007041, AL096678, U96629, AC002301, AL121825, AC006323, AC007283, AC007066, AC005792, AC007225, AC006270, AC002398, AC006023, AL031589, AC005488, AC004922, AC007461, AL049646, AL135744, AC006511, AC004000, AL117344, AC006430, AC004655, AC004685, AL121658, AC004222, AC007878, AC004531, L77570, AL050332, AC003967, AC005057, AL021578, AL024507, AC004139, AC005846, AC005837, AP000260, AC005796, AC003003, U91321, Z85986, AC004216, AC004671, AC004526, AC006487, AL132774, AC005531, AC004878, Z95113, AL139054, AL049697, AC005829, AL022721, AL133355, AC005919, AL031132, AL121652, AC005291, Z82208, AC002310, AC006077, AC004983, AC008498, AC005484, and AC005666. |
| HHLBA18 | 175 | 527530 | 1 - 287 | 15 - 301 | AA309288, and AA309302.   |
| HISAC25 | 176 | 678054 | 1 - 550 | 15 - 564 | R83066, H88059, and T19075.   |
| HISAJ35 | 177 | 707172 | 1 - 349 | 15 - 363 |   |
| HISAM61 | 178 | 974576 | 1 - 718 | 15 - 732 |   |
| HISAN16 | 179 | 661752 | 1 - 362 | 15 - 376 | AI762464, H96353, W52333, AW005759, AI567449, W52311, AA417658, C06018, H85374, AF070666, and AF228418.   |
| HISAN47 | 180 | 710943 | 1 - 306 | 15 - 320 | AA205399, H25580, D45750, AW156895, AI452450, AW263536, and US5184.   |
| HISAT61 | 181 | 488809 | 1 - 360 | 15 - 374 |   |
| HISBA01 | 182 | 916165 | 1 - 353 | 15 - 367 |   |
| HISBB09 | 183 | 964344 | 1 - 378 | 15 - 392 | AA719847, AA069254, and AC005215.   |
| HISBB67 | 184 | 751467 | 1 - 397 | 15 - 411 | H79323, AA628627, AL031668, L78833, AC004832, AC004960, Z86090, AL023802, U73630, Z98752, AL031276, AP000556, AL023799, AC008115, Z98272, AC007253, Z81450, AC004973, AC004913, AC004668, AC003982, AB017602, AC002039, AC004916, AL023803, AC005940, Z95152, AC005202, AC003687, AP000557, AP000552, AC004812, AC007543, AC005411, AC003963, AC004811, and AC006009.   |
| HISBE32 | 185 | 677148 | 1 - 458 | 15 - 472 |   |

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|---------|-----|--------|---------|----------|---|
| HISBG13 | 186 | 657005 | 1 - 388 | 15 - 402 | T88699.   |
| HISBH10 | 187 | 964359 | 1 - 432 | 15 - 446 |   |
| HISBJ96 | 188 | 796306 | 1 - 328 | 15 - 342 |   |
| HISBO64 | 189 | 745884 | 1 - 406 | 15 - 420 | AW117195.   |
| HISBT02 | 190 | 919509 | 1 - 447 | 15 - 461 | AW264600.   |
| HISBU45 | 191 | 717604 | 1 - 681 | 15 - 695 | AA417810, and AW103464.   |
| HISBU68 | 192 | 693115 | 1 - 382 | 15 - 396 |   |
| HISBW20 | 193 | 669525 | 1 - 639 | 15 - 653 | H85310, AW020413, AA813343, and AI806413.   |
| HISCF72 | 194 | 740183 | 1 - 408 | 15 - 422 | AW173015.   |
| HISCH85 | 195 | 761973 | 1 - 518 | 15 - 532 | AA627075, AA631714, AI479807, AI359396, AA528184, AI860932, AI828517, AA947640, AI609019, AI829984, AI560408, AI719121, AI420471, AI698992, AI041652, AA622678, AW072220, AW243981, AW025818, AA287630, AA983885, AW275394, AA604879, R72570, H63981, H24824, AI864546, AA887706, AI700883, AI475364, AA579648, AI183273, AI205801, AI867829, AA531533, AA994860, AA953158, AA588021, AA436860, AW050606, AA974927, H42312, AA442617, AA282509, AA347744, AA931153, AA651826, AA994191, H02868, H87783, AI524119, W74308, AA773196, AI458825, AA576762, AI632938, AI973009, AI440250, AI632950, AI738914, AA573307, AA523385, AA523403, AW028760, AI829899, AI573013, W19381, AI359895, H00155, R22801, AA579577, R16093, T69750, AW170108, AI827077, R15727, AW194872, H24777, AA743192, AA286723, N92795, AI000057, H22337, and R24453. |
| HISCJ83 | 196 | 831507 | 1 - 476 | 15 - 490 | AA025795, and AA025796.   |
| HISCK85 | 197 | 857497 | 1 - 463 | 15 - 477 |   |
| HISCL06 | 198 | 935079 | 1 - 439 | 15 - 453 | M77899, AA834297, TI6056, AA132914, H50834, AA347170, F09736, F01141, AA368679, AC005100, L44140, L43392, AL078621, AF060568, U67274, U20770, AC007314, AP000302, AP000114, AP000046, X58156, AF193806, U55180, AC006137, AL021392, U07000, AP000010, AC005356, AC006480, AP000431, AP000563, AP000211, AP000133, and AC005082.   |
| HISCN24 | 199 | 764837 | 1 - 417 | 15 - 431 | R69549, AW300639, AA630465, and AI034430.   |

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|---------|-----|--------|----------|-----------|---|
| HISCP11 | 200 | 966171 | 1 - 390  | 15 - 404  |   |
| HISCV30 | 201 | 883892 | 1 - 736  | 15 - 750  | N64812, and N75663.   |
| HISDM43 | 202 | 974583 | 1 - 681  | 15 - 695  | AA890180.   |
| HISDO59 | 203 | 857479 | 1 - 867  | 15 - 881  | AA327184.   |
| HISDS91 | 204 | 787603 | 1 - 442  | 15 - 456  | AW294889, W95876, AW026465, AI371099, AW103708, D60327, and AC003090.   |
| HISDT82 | 205 | 790966 | 1 - 550  | 15 - 564  |   |
| HISDU39 | 206 | 745914 | 1 - 520  | 15 - 534  |   |
| HISDV63 | 207 | 788753 | 1 - 362  | 15 - 376  |   |
| HISDZ80 | 208 | 775474 | 1 - 556  | 15 - 570  | AP000066.   |
| HISEA07 | 209 | 952295 | 1 - 320  | 15 - 334  | H05255, and AC004104.   |
| HISEE71 | 210 | 759828 | 1 - 418  | 15 - 432  |   |
| HISEJ18 | 211 | 783919 | 1 - 328  | 15 - 342  |   |
| HISEJ39 | 212 | 789809 | 1 - 398  | 15 - 412  |   |
| HISEN88 | 213 | 760209 | 1 - 493  | 15 - 507  |   |
| HISES80 | 214 | 775598 | 1 - 427  | 15 - 441  | AC007358.   |
| HLDAK38 | 215 | 689904 | 1 - 445  | 15 - 459  |   |
| HLDBF84 | 216 | 924101 | 1 - 1354 | 15 - 1368 | AI057008, N54429, N68450, W02198, N73582, H55898, N91067, H61872, H60652, H64326, AA342972, T68527, H65614, AI651926, AI248786, T68461, T53810, N91293, T90818, H59838, H91121, AW241535, H54060, H89498, H60134, AA344190, T53934, T85721, H60133, H54059, H82326, H65615, AI651938, N63663, and N74009. |
| HLDBJ86 | 217 | 882365 | 1 - 440  | 15 - 454  | AI016020, and AF097518.   |
| HLDBR32 | 218 | 752494 | 1 - 537  | 15 - 551  |   |
| HLDC51  | 219 | 871341 | 1 - 376  | 15 - 390  |   |
| HLDCG82 | 220 | 657567 | 1 - 530  | 15 - 544  | AC002553.   |
| HLDCI35 | 221 | 831356 | 1 - 761  | 15 - 775  | AI760643, T78476, AI913746, N74639, AW450191, R99475, AI672811, T71577, N58369, AW444631, T40936, T91004, T78557, R99474, R28738, R93411, T81723, T84581, AW300983, T82031, and AF209192.   |
| HLDCU27 | 222 | 950724 | 1 - 304  | 15 - 318  |   |
| HLDDH01 | 223 | 926360 | 1 - 333  | 15 - 347  |   |
| HLDDI91 | 224 | 790003 | 1 - 594  | 15 - 608  | N77737, AA577996, AA678055, and AF209192.   |

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|---------|-----|--------|---------|----------|---|
| HLDDK12 | 225 | 923442 | 1 - 405 | 15 - 419 | AC007878.   |
| HLDDL55 | 226 | 875000 | 1 - 442 | 15 - 456 | AI420986, AA558494, AA742449, AI264145, AA582499, AA954657, AA908360, H30455, AA456055, AI991352, AL047763, AW071417, AI445025, AL036146, AI349933, AI250293, AI340582, AL135661, AI702406, AW071349, AL046849, AW195957, AI540832, AI613017, AI439087, AI678302, AI568870, AI249257, AI500077, AI207510, AI702433, AW274192, AI868831, AI498579, AI433976, AI866608, AL121270, AL036396, AW238730, AI499463, AI349645, AI064830, AL047042, AW303152, AI800453, AI800433, AI538716, AI633419, AI866002, AI568855, AW169653, AL048871, AW301409, AW103371, AI349772, AI590128, AI349004, AI433157, AW074993, AI349614, AI699857, AI445432, AI857296, AL045903, AI635461, AI625079, AI440426, AL036802, AI312152, AI597750, AI758437, AI349937, AI521012, AI275175, AI281779, AW074869, AI224992, AL040243, AI564719, AW148320, AI567351, AI620284, AI343112, AW268253, AL045500, AL119791, AL036274, AI345735, AI866887, AW089572, AW162071, AW068845, AI687728, AL043326, AI497733, AI434281, AI687375, AL121365, AI499131, AL119049, AI500553, AL038605, AI673256, AL036361, AI348897, AI873731, AI863014, AI349256, AI636456, AI439745, AI282655, AI440239, AI800411, AI690751, AI281773, AL036759, AW085799, AI811863, AI269696, AI969601, AI269205, AI568854, AL036980, AI686926, AI567632, AA508692, AI366549, AL038779, AI631107, AI610645, AI570384, AI624668, AA572758, AI753683, AW117882, AI539771, AI636445, AI815383, AW002342, AI697137, AI281762, AI469811, AI969567, AI499393, AI818683, AI920968, AI436456, AA613907, AI271786, AI569616, AI285735, AI608667, AA640779, AI682841, AW087445, AL038778, AI446628, AL119748, AL121014, AI475371, AI620868, AI690835, AI687376, AI469532, AI679724, AI610307, AI580190, AI475134, AL121463, AI343059, |

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| AI432229, AI500659, AI799199, AI349226, AW235035, AI934036, AI889203, AI754897, AI345744, AI580984, AI680113, AI862142, AI874109, AI889839, AW078529, AW301300, AI349598, AI273142, AW075351, AI628205, AI597918, AI539153, AL042753, AI921379, AL120854, AI609592, AI859733, AI583316, AI492540, AI802542, AI282903, AW026882, AW166645, AW167776, AI610756, AW080838, AI445165, AL040169, AI872711, AW129202, AI432969, AW169671, AL044207, AW118512, AW196141, AW104724, AI334902, AI804585, AI696398, AI609580, AW302992, AI919058, AL120736, AI282281, AI671679, AI619502, AI687415, AI609331, AI922901, AI799305, AI818206, AI952114, AI679764, AW268768, AI591311, AI866780, AI906328, AI907070, AI493248, AL047041, AI888953, AI345778, AI590120, AI872074, AI536685, AI684265, AL119828, AI290154, AI274541, AW168384, I48979, AF113691, Y11587, AF090934, I89947, AF113694, AF090901, AL110196, AL080060, AF118070, S78214, AL137527, AF118064, AJ242859, AL133016, AL133640, AF078844, AF090900, AF090903, S68736, AF113013, A93016, L31396, L31397, AF090943, AL049452, AF125949, AF113690, AL133606, AR059958, AL110221, AF113689, AF104032, AL117460, AL050149, AL050393, AL050108, I89931, AL117457, AL050146, AF090896, X84990, AF106862, AL049938, AF113676, A08916, AL122050, AL133075, U42766, AL050116, AF113019, AB019565, AL133557, AF113677, A08913, AL080137, AL049314, AL122093, AJ000937, AL049466, AF017152, AL050277, E03348, AL137283, AL133093, AL133565, AL080124, AF158248, AF113699, AL122121, AL137557, AL096744, E07361, AL133080, AF125948, AL050138, AL122123, AF111851, I48978, Y11254, X63574, AR011880, AL049430, AL137459, Y16645, AF146568, AF091084, U91329, AL117394, X82434, AF079765, AL110225, AF097996, AF177401, AL117583, AL117585, I49625, AL133560, E07108, U00763, AL049300, AF017437, AF067728, |  |  |  |  |
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|---------|-----|--------|---------|----------|---|
|         |     |        |         |          | AL137550, A65341, AL049382, A08910, AL049464, AJ238278, E02349, A08912, X70685, S61953, AF095901, A58524, A58523, AL050024, AF183393, AL122098, AL133113, AL117435, AF118094, Z82022, A08909, AC007390, X96540, AL137538, I33392, A03736, AL137271, AL137648, AL137463, AL096776, A12297, I09360, AL049283, AL080127, I03321, A77033, A77035, AF087943, AL035067, AL034400, AL122110, AC006112, U80742, U72620, X72889, AL035458, AC006371, AC006336, AL110197, Y09972, X93495, U35846, AC004878, X65873, AC006840, AC002467, AL022147, E05822, I42402, AL133568, AL133072, AC004987, X98834, U67958, AF110520, AL080159, AL137521, I17767, AL021393, AP000247, AF000145, AF061943, E08263, E08264, AR000496, U39656, AC004093, AF111112, AF177767, AR013797, AL034417, I66342, AC005094, AF057300, AF057299, AF119337, E15569, AL133077, I26207, AL137556, AL080074, AF061981, AJ012755, AL137523, U62317, A93350, AL137560, AL031346, U58996, AF026124, AL078602, A08911, AL133104, AL122049, AC004797, AL133014, X87582, M30514, AL122111, AC006222, AL137526, AL137533, AR038969, L13297, AF026816, Y14314, I00734, and AC004200. |
| HLDNJ57 | 227 | 733903 | 1 - 406 | 15 - 420 | R09042, and N66008.   |
| HLDNU53 | 228 | 883158 | 1 - 779 | 15 - 793 | T79293, AW299681, AA777852, AA705161, T68667, AI928177, N59580, and AF097518.   |
| HLD0A63 | 229 | 949166 | 1 - 509 | 15 - 523 | T46901, and T74588.   |
| HLD0B53 | 230 | 728220 | 1 - 300 | 15 - 314 | AC005320.   |
| HLD0G86 | 231 | 682265 | 1 - 297 | 15 - 311 | N76019, and C21130.   |
| HLDON90 | 232 | 788891 | 1 - 691 | 15 - 705 | H54384, AW021286, AA548081, AA704453, AA728877, and AA715354.   |
| HLDOR73 | 233 | 683262 | 1 - 280 | 15 - 294 | AA484455, and AF153821.   |
| HLD0U12 | 234 | 857106 | 1 - 544 | 15 - 558 | AF202889, AC007707, and AF202890.   |
| HLD0Z69 | 235 | 697988 | 1 - 686 | 15 - 700 | U73330.   |
| HLDPA63 | 236 | 744341 | 1 - 315 | 15 - 329 | H55681, AJ084348, AJ230815, AW270278, AA737444, H61631, AI355513, N41806, AA584482, AA584101, N33867, AA555244, T51930, AA150598, H68042, AJ272241, H15652, AA747377,   |



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|  |  |  |  |  | <p>AA730731, AI521042, AI553670, AA220975, AA515168, AA593419, AW089898, AA745189, AA995445, AA179792, T91561, AW245336, AA121391, H61926, AA662700, AI302994, T16427, AA182569, AA831714, AA663406, AI354243, AI761862, AA570632, AA100540, AI473851, AA662598, AA189069, AI620666, T58367, AA018183, AA502207, AW074382, T94070, AI926102, H91844, AI054339, AW302017, AI254779, AA627154, AA074342, AI521525, AA613343, AI311779, AI537368, AA814446, AA584603, AW020150, AI002931, AI872917, AA302979, AA526514, H68186, AW022317, AA338659, AI858864, AI871806, AA804866, AW250983, T93989, R72456, N92689, N90460, AA773480, AA077959, AI039471, AW118304, AA071132, AA719741, AA557877, AA484237, F17312, AA367745, AI540331, AA668133, H75720, AA658268, AA226356, H26982, AI567873, AA774132, AA579031, AA652813, AA559122, AA421889, CI5966, AI538075, H91881, AI051656, AI521273, AI800204, AA094312, W80952, AA635150, AA668390, H89643, AA661590, AA485630, AA579724, AA047009, AA176257, AA774095, AA702080, AA116106, AA663054, AA112646, AW172952, AI791664, H68123, AI611222, AA648683, AA166686, AA630173, AA486530, T52557, T40254, AA668670, R87193, AA558716, AI460383, N23637, AA848131, AA640797, AI335963, AA702539, F36184, AA595206, AA680247, AA634786, AA776899, AA046838, AA876128, AA558402, AA460352, T59416, AA804714, T73597, AA161476, AI376097, N83759, AA714754, AI135490, AI270476, AI636587, AA825288, AA605201, R42488, N85221, H23431, AA730029, AA831152, H61367, AI623364, AA555241, AA526416, AA493808, AW404543, AA833896, AA833875, AI341712, AA551105, AA828570, AA600341, AA629540, F07083, AA670132, AA730609, AA196379, C17633, AA581263, AA748901, AI679480, AA125781, AA554793, AI922673, AI054395, AW083707, AA338262, AA610219, AW304519, AI538252, AI302350, AA600320, N67193, AA829565, AI251576,</p> |
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| AI306232, AI701959, AI583466, AA845700, AI537931, AA346043, AI120708, AA826742, AI453155, AA156323, AA916177, AW328172, AA908329, H94979, AI891143, AI367721, AI024339, AI285663, AW439555, AA526326, AA640704, AI246996, AA653983, AA219299, AA955035, AA172191, AI045476, AA526625, AA937446, AW074223, AA831903, AA135761, T50694, AI078409, AI038475, AI021937, D87022, AC009479, Z46936, AC005091, AF045555, AB017652, AC005081, AI109827, AJ011931, AP000315, AC006023, AI078613, AF130343, AP000118, AP000165, AP000496, AF196972, AC012380, AF049895, U95743, AC003990, AC006538, U82672, AC004838, AI121754, AC004844, Z68873, AP000263, AC005274, AI031316, AC004706, AC000404, AP000100, AC004167, AC004787, AI109653, Z82204, AC003041, AP000036, AC004226, AC005023, Z82244, AI050307, AP000067, AC005406, AC009946, AC005376, AI008715, AC004057, AC003669, AI035690, AC004914, AC007103, AP000072, AC007279, AI023876, AC007563, AP000557, AF010238, AI021940, AC009263, AI031602, AC004860, AI117338, AC003684, U91321, AC004106, AC007684, AJ251973, AC005066, AC004859, AF176915, AC002448, AI031785, AC006130, AI022314, AC006973, AP000564, AF043945, AC002524, AI023513, Z99916, AI022320, AP000290, AC006013, AC004554, AC006371, AI023913, AI022067, AC004817, AI135960, AJ131016, AC002549, AC005516, AI031671, AF123462, AC003093, AB020873, AP000346, AC020663, AI031657, AI049553, AI049631, AI050331, AC002492, AP000949, AC004020, Y18000, AC006466, AC006480, AC005390, Z83826, AC004945, AE000660, AC005017, AC007731, AC002464, AF146367, Z97989, AC005500, AC007317, AC007690, AP000688, AC005332, AC006101, AI008635, AI021808, AC005261, AI031075, AI035494, AF124730, AC006946, AC006262, AC006230, AC003014, AC006368, AI031073, Z98200, AI133163, U82668, AC007559, |  |  |  |  |  |
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|         |     |        |          |           | AC005871, M87915, AC004072, AL133321, AC008056, AC007227, AC006455, Z70272, AC002465, AP000023, AC005548, AC005597, Z98304, AL022322, AC004092, Z83819, AF006487, AL034548, AL008729, AC005808, AC006008, Z82181, U72787, AC002090, AC006476, AC010206, U13369, AC006380, AL078471, AC005752, AF027974, AL096707, AL133355, Z84486, Z85996, AC007252, AC005235, AC005962, Z98884, AC004047, AC004068, AL008583, AP000884, AC009731, AL078623, AC007435, AF121898, AP000078, AF129756, AL133353, AC004985, AC004678, AL078476, AC005216, Z92546, AC006486, AL035400, AC002401, AC005998, AC007685, Z82195, AL035088, AL035700, AC005694, AC012627, AL034374, AC005488, AC008994, AC002375, AJ003147, AL031735, AC005152, AC006080, AF064858, AL022163, Z97054, Z94056, AC004843, U82695, AC005410, AL121653, AL008721, AC006502, AL020989, AC004061, Z70289, Z92540, AC007857, AC002303, AL034417, AL078472, AF027390, AC007878, AP000966, AC007671, AL009172, AC004852, and AC005191. |
| HLDQA88 | 237 | 796173 | 1 - 285  | 15 - 299  | Z54728, and Z54729.   |
| HLDQB65 | 238 | 708002 | 1 - 437  | 15 - 451  | AI090052.   |
| HLDQC62 | 239 | 923559 | 1 - 1340 | 15 - 1354 | H62757, AA778222, H47743, R98624, H60487, and H54740.   |
| HLDQH10 | 240 | 932015 | 1 - 510  | 15 - 524  | N56664, and AB023136.   |
| HLDQQ76 | 241 | 953312 | 1 - 524  | 15 - 538  | AI093928, AI439848, T50791, AW449664, T68870, AI623302, AI431307, AI431316, AI431238, AI432661, AI432666, AI432655, AI432644, AI431235, AI432657, AI431246, AI431350, AI431347, AI432653, AI431323, AI431231, AI431230, AI431257, AI431321, AI431318, AI431315, AI431328, AI432654, AI431310, AI431312, AW081103, AI432650, AI432677, AL045494, AL042523, AI431247, AI431354, AL042729, AI431353, AI492519, AF086735, Y17793, and AF019249.   |
| HLDRD44 | 242 | 697576 | 1 - 921  | 15 - 935  | AI335086, AI302888, and T40004.   |
| HLDRE54 | 243 | 727954 | 1 - 251  | 15 - 265  | AC005668, and AC005233.   |
| HLDRE26 | 244 | 681284 | 1 - 531  | 15 - 545  | R70015.   |

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|---------|-----|--------|---------|----------|---|
| HLDRE66 | 245 | 966517 | 1 - 238 | 15 - 252 |   |
| HLDR194 | 246 | 784582 | 1 - 384 | 15 - 398 | AW002504, AI962026, AI955061, AI828858, AA489230, AI203414, AI097549, AI422926, AI355971, AW195500, AI423708, AW001625, R07167, and R07166.   |
| HLDRP14 | 247 | 657908 | 1 - 677 | 15 - 691 | W31702, AW303472, AA834684, AC007242, AL034375, AL008627, AP000304, AP000047, AP000115, AC004998, AB020877, AC008078, Z97352, AC004531, AC008125, AL023803, AL118512, Z97206, and AC008045.   |
| HLDRQ82 | 248 | 837031 | 1 - 773 | 15 - 787 | AI209097, AI073500, AI744810, AI218488, AA312659, AA400307, AA779312, T50722, T72192, T69305, T50877, AA401562, AA745947, AI240480, T74831, AI024280, C21015, T74746, T72971, and AF064255.   |
| HLDRR54 | 249 | 708594 | 1 - 349 | 15 - 363 |   |
| HLJBI35 | 250 | 870387 | 1 - 598 | 15 - 612 | AA682991.   |
| HLJBJ13 | 251 | 910830 | 1 - 409 | 15 - 423 | AW299514, AI796131, AW299658, AW058550, AI767984, and AF152562.   |
| HLJBO03 | 252 | 923519 | 1 - 302 | 15 - 316 |   |
| HLJBP66 | 253 | 750608 | 1 - 219 | 15 - 233 |   |
| HLJBZ48 | 254 | 721023 | 1 - 331 | 15 - 345 | W90538, and AA345641.   |
| HLICR73 | 255 | 837030 | 1 - 485 | 15 - 499 | T69381, AI765674, Z20524, AW025169, AI565556, T72971, AL042852, and AF064255.   |
| HLICT47 | 256 | 929754 | 1 - 342 | 15 - 356 |   |
| HLICT57 | 257 | 734451 | 1 - 486 | 15 - 500 |   |
| HLPBD66 | 258 | 928708 | 1 - 516 | 15 - 530 | AW118937, AI123209, AW001864, AI377932, AI912990, AI805972, AI651420, AI285856, AI141443, AI673052, AI221575, AI743946, AI760176, AI754531, AA026012, AI660528, AI949710, H19313, AI249502, AI460280, R77684, AA026000, AA829761, R77685, AI687732, AI812062, AA084602, C21025, and AF147395. |
| HLQAF70 | 259 | 529348 | 1 - 291 | 15 - 305 |   |
| HLQAL33 | 260 | 702755 | 1 - 428 | 15 - 442 | R80289, and R34778.   |
| HLQAN64 | 261 | 966910 | 1 - 620 | 15 - 634 | AI052592, AI052580, AA928708, H56001, R97419, AW242444, H57112, AF090318, and AF090320.   |
| HLQAZ69 | 262 | 960046 | 1 - 288 | 15 - 302 | AW392897, AL021920, and AB007923.   |

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| HLQBF72 | 263 | 608371 | 1 - 354 | 15 - 368 | AW136027, AI634613, AW082330, AA995665, AA292087, AI201246, AI693706, AI675765, AW390785, AA868564, AI654869, AW390814, AI077669, AI695580, AI805189, AC004893, and AF199364.   |
| HLQBH46 | 264 | 527923 | 1 - 369 | 15 - 383 |   |
| HLQBI21 | 265 | 529342 | 1 - 733 | 15 - 747 | AI913732, H70488, C20914, AL121739, AL021879, AF104312, and AB024079.   |
| HLQBL71 | 266 | 542262 | 1 - 196 | 15 - 210 |   |
| HLQBX13 | 267 | 856783 | 1 - 209 | 15 - 223 |   |
| HLQBX23 | 268 | 676205 | 1 - 318 | 15 - 332 |   |
| HLQCN58 | 269 | 706239 | 1 - 425 | 15 - 439 |   |
| HLQCY26 | 270 | 681459 | 1 - 257 | 15 - 271 | TI9011, AB003151, and AP000688.   |
| HLQDB55 | 271 | 731601 | 1 - 376 | 15 - 390 |   |
| HLQDC82 | 272 | 779697 | 1 - 661 | 15 - 675 | AA056145, AI889521, AI422011, AA677596, AI831767, AA463625, AI670807, AA639920, AI262820, AA502322, AA428450, AA029914, AI580188, AA443521, N71012, AA171922, Z41654, AA629920, AI217583, H66183, AA443042, AA030044, and AC005996.   |
| HLQDE61 | 273 | 741706 | 1 - 345 | 15 - 359 | AC007529.   |
| HLQDP11 | 274 | 966775 | 1 - 343 | 15 - 357 | AI671077, AI679294, AI679871, AI567391, AI273837, H29241, AA558404, AA564642, AA847499, AI281622, AI539822, AA649274, AC006065, AL022311, AC005197, AC005837, AC004477, AF047825, AL022318, AF196969, AP000300, AC006449, AF053356, AL034420, AP000501, AC005015, AC005412, AP000045, AL031311, AC007993, AD000092, AP000113, AL035072, AC005488, AC002316, AC005231, AP000102, AL049759, AC004596, AC005730, AP000248, AC005318, AC007537, AC005527, AL050306, AL049776, AL050318, U63721, AC005775, AL121655, AL031587, AC002544, AC005529, AL080243, AC004821, AC004491, AL031283, AC005082, AP000049, AC005081, AC007347, AC004019, AC002395, AC002425, AC004972, AC002991, AC004605, Z83844, AP000311, AC005071, AC006014, AC005839, AC003982, AL133163, AL031291, AC003030, |

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| HLQDU40 | 275 | 488692 | 1 - 311 | 15 - 325 | AF001549, Z82184, AL096791, AC000353, AC004883, AF190465, AL023807, Z98051, U91318, AL109627, AF134726, AC005041, AC005280, AL035420, AP000355, AL034423, AC007193, AC004825, AC005484, AC009516, AL049569, AC002369, AL035681, AC006064, AC005102, AC000134, AC004933, AF045555, AF109907, AC005726, AC005920, AL049766, AL023575, AC007226, AL133353, AC004805, AL133245, AC005755, AC005088, AC005971, AL021707, AL034421, AC005330, AC005694, AP000030, AF135028, AC007151, AL121769, AL031276, AL049795, AP000466, AC004812, AF207550, AC020663, AC003108, AF001548, AC004973, AC005630, AF111168, AC007731, AC006211, AC005500, L44140, AC005261, AP000152, AC005793, AC007199, AL031681, AC002477, AC004834, AC005531, AL031848, AC004099, AC002470, AC005944, AP000210, AP000132, AC005067, AL035658, AB003151, AL034548, AP000266, AC005225, AC006450, U80017, AC004985, AC006285, AC004841, AF196779, AF129756, U62317, AC005288, U29953, U91326, AC004791, AC004876, AC003957, AP000558, AL035086, AL031281, AL031589, AC002347, AF200465, AL021154, AC004531, AC005300, AC006509, AC005921, Z97989, AP000251, AC005829, and AL035659. |
| HLQDY10 | 276 | 856755 | 1 - 461 | 15 - 475 | AA827683, AA584644, AA731210, AA837295, AA836453, and AA287331.   |
| HLQED11 | 277 | 966015 | 1 - 281 | 15 - 295 | AA720741, AL042373, AA351868, AW029626, AI888050, AI114755, AA565534, AC005911, AC005253, AL022165, Z75887, AL049709, AC007057, AL049872, AC005624, AL021707, AL121915, AC007686, AC005529, AC004881, AL133382, AC003042, AC005280, AC006285, AC004448, AC007129, AF053356, AC002350, AL035451, AL031677, AC004019, AC003665, AC006538, AC003682, AL022393, AL117352, AL022721, and AL096791.   |
|         |     |        |         |          | AA357240, AA626678, AA515435, AA377730, AL036706, AA843450, AI572560, AA633936, AI148446, AL039958, AI284640, AI053672, AW419262, TS6067, F25276, AI954260,   |

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|  |  |  |  |  | <p> F36273, AI937850, AI334443, AA468486, AA776971, AA302523, AI610159, AI564185, AA330380, AA810318, AW193265, AW302907, AL046457, AW340922, AA514819, AW390126, AW102955, AL119391, H64777, AI561060, AA595782, AW074398, F32894, AI889923, AA017322, AL138455, AW338869, AA513972, AA632563, AA084070, AA621858, AI499938, AA630925, F32926, AA919037, AA325699, AI653886, AA627160, AA508080, AA489775, AA434484, AA491762, AW069481, AC005072, AF006752, AC005730, AC002553, AC005184, AC018633, AC006195, AC007536, AC005488, AP000077, AC005242, AC005993, AP000502, AC004919, AC006012, AC005191, AC005837, Z70224, Z49258, AP000302, AL031005, AC010202, AF134726, AL031056, M87918, AL050348, Z98950, AP000114, AP000046, AC004485, AF067844, AC005082, AC006115, AC008044, AL049759, AL021155, AC005037, AC000159, AC005726, AL031176, AL035658, AC004854, AC007447, AL049869, AP000141, AC008134, AP000193, AP000049, AC007043, AL008725, AC005544, AC005231, AP000311, AC006019, AL049757, AL035417, AC005043, AC006167, AL034554, U85195, AP000117, AC011311, AC006312, AL031255, AL078603, AP000146, AC006111, AC004963, AC004087, AL031985, AL079340, AC006449, AE000658, AL050306, AC004184, AL035045, AC007537, AF196969, AC005755, AL049699, AL034417, AF002223, AC007981, AC009178, AC006207, AC002491, AB003151, AB023050, AL022318, AL031387, AC007055, AC005288, AF108083, Z84572, AC005355, AC007666, AL049761, AF205588, AC005083, AC002476, AL009181, AC005972, AL031774, AC004858, AF109907, AC005023, AC002379, AL133289, U58675, AP001116, AP001172, AC006479, AC007630, AC006211, AC005066, AP000511, AL031721, AC004019, AC006432, AL117351, AC000052, AF064858, AL031289, AC008079, AC006538, AL109827, AL049780, AC005264, AC007676, AC004682, AC008372, AC006511, AC020663, AC004098, </p> |
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| HLQEH54 | 278 | 871683 | 1 - 641  | 15 - 655  | AC002395, AC008072, AF039590, AC005912, AC005829, AL031224, AC005324, AC004859, AC005081, AC005015, AC004828, AC006274, AC005594, AC003983, and AC002984.<br>AI935557, N53561, AI435571, AI628733, AW104342, AI950465, H57932, N91619, AA701378, AA410255, AI056635, W86579, AA705304, H58023, R85396, N68729, AI492415, T54915, AI239546, AA928077, AI910761, W86712, AI076347, AA406529, AW299867, T95811, T95812, AA689340, T55082, N72520, R59629, F09287, and AL109938.  |
| HLQES58 | 279 | 856725 | 1 - 538  | 15 - 552  | AC003034.   |
| HLQEY16 | 280 | 856712 | 1 - 406  | 15 - 420  |   |
| HLQFD23 | 281 | 856701 | 1 - 467  | 15 - 481  |   |
| HLQFO69 | 282 | 933385 | 1 - 851  | 15 - 865  | AI378007, AW118802, AA703945, AW117265, AI023239, AI887376, AI819938, N32787, AA858163, AI304385, AA815054, AI859862, AI810059, AI393415, AA948491, AI886088, T62800, AI123750, N41789, AW183288, AI300250, AA838276, AA092069, AW264818, AA070204, and AA922124.   |
| HLQKG74 | 283 | 856736 | 1 - 1023 | 15 - 1037 | AA777852, AA705161, AI042209, AI928177, AI654148, AA813350, AW295882, N53049, AI470632, AA740656, T79206, N69913, R37797, N57759, N73233, N53068, N74422, N53052, N59580, N73255, T68587, AA699764, R12776, AA211797, AI022232, T16909, R00599, N73237, AA720617, R00498, T69188, T69130, N74370, AA720618, AW237757, AA702356, AW299681, T79293, and AF097518.   |
| HLQGN56 | 284 | 842004 | 1 - 529  | 15 - 543  | AI264223, AI742821, W51908, AI3444621, AI2444990, AI090358, H66320, N52269, W04231, H66367, AW024722, AI189682, AW238594, AA599354, AW021399, AA515733, AA482928, AA485831, AA487209, AA516193, AI206841, AA199578, AA977307, AI719142, AI567676, AI245693, AA347203, AA807921, AA627921, AA631146, AA598608, AC005082, U95742, AC003982, AI022238, AC007386, AC006512, AC005015, AC006064, AC005755, AC004000, AC002476, AI035659, AC002302, AC007637, AP000692, AC006344, AL022333, AC004771, AC004804, AC005377, AC005480, AP000552, AF190465, AL049757, AC005412, AC007199, |



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| AP000547, U91321, AC004796, AC004465, AC004895, AC005914, AJ010770, AL049872, L78810, AC007066, AC004953, AC006001, AC004217, AL117340, AL031291, AC006571, AC004815, AC007917, AC012384, AL121658, AL031230, AC004526, AC003684, AC002375, AC006965, AC004797, AC004859, AC005409, AC007371, AC006960, Z93930, AL049759, AP000248, AC004552, AF205588, AC006277, Z98304, AC005482, AL096701, AC005049, AC004167, AL139054, Z82198, U85195, AL049709, AC002430, AC007050, AC003665, AC005722, AC006236, AF001549, AC004477, AC003108, AC007057, AC007225, AC004983, AF111168, AC007216, AL031311, AC006530, Z97181, AL021578, AC005519, AC005071, AP000555, AC006111, AE000658, AC007384, AC006101, AL133445, AC005969, AC004913, AC006480, AC005066, AP000556, AC002477, D87675, AC005245, AL020997, AC005921, AC005180, AC005740, AL035423, AL133246, AL049694, AL031295, AL034555, AC005037, AL049830, AC009464, AC006441, AC005971, AC005207, AP000113, AP000512, AC002429, AC005878, AC002470, AL035461, AC002041, Z95113, AC004019, AC005620, U96629, AC005771, AC007065, AC004673, Z93023, AC004974, AP000116, Y10196, AC006039, AL031281, AF067844, AL096791, U91326, AL021808, AC005486, U47924, AC005244, AL049776, AC005696, U80017, AP000151, Z99943, AF200465, AC002553, AL096678, AC005102, AC006077, Z98884, AC006581, Z98749, AL117338, Z97054, AL023553, AC009721, AC007731, AC005678, L78833, AC005011, AC010582, AC002351, AL049869, AC008372, AC006544, AC005154, AC005393, AC005924, AC005031, AJ010598, AL133241, AC007686, AL121653, AL031284, AP000359, AC005225, AC005065, AC005730, AC005598, AC002544, AC005844, AL022329, AC004033, AC006317, U52111, AC005399, AL035455, AB020868, AC010197, AC006486, AC005295, AC002036, U63721, AL080243, AL031846, AL109963, AL031666, AC009516, AP000510, |  |  |  |  |  |
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|---------|-----|--------|----------|-----------|--|---|
|         |     |        |          |           |  | AF064858, AC006146, AC004890, AC005783, AC005777, AC006006, Z98949, AL049538, AC005944, AC009247, AC004975, U91323, Z85987, and AL022165.   |
| HLXTF06 | 285 | 931101 | 1 - 281  | 15 - 295  |  |   |
| HNAAA40 | 286 | 574045 | 1 - 344  | 15 - 358  |  |   |
| HNAAE33 | 287 | 574001 | 1 - 176  | 15 - 190  |  |   |
| HNAAE73 | 288 | 922929 | 1 - 336  | 15 - 350  |  |   |
| HNALD49 | 289 | 723168 | 1 - 597  | 15 - 611  |  | AA405939, AL110219, AF190862, and Z83844.   |
| HNJBA08 | 290 | 955993 | 1 - 1597 | 15 - 1611 |  | AA026755.   |
|         |     |        |          |           |  | AA626793, AW371970, AI149147, AI962386, N57426, AW295290, AW341196, AA811125, AA973041, AW025864, AW375504, AI078419, AW269550, AA281527, AI858149, AA831209, N32331, AI087365, AI000710, AA971571, AW275545, AA936889, AI767131, H94323, AI818072, N48251, H96360, AI301505, AA281528, AA749459, AW170509, AI160322, AI362012, AA954535, AA515033, AA584953, H13510, AA700795, W81370, N94553, H79658, AI799151, H96359, AW192808, AI014406, AI928296, AA451944, AA312205, W81628, W30844, AW015967, AA451984, AI767192, AI638443, R25745, T86900, W30890, H79659, AI383042, AA356792, AA995999, AA487287, AW393332, AA730481, AW058463, AA095644, AA294847, AW375501, AI247784, AA174181, AI459049, AA032012, AW264654, AW339209, and A63552. |
| HNJBB04 | 291 | 927458 | 1 - 296  | 15 - 310  |  |   |
| HNJBJ80 | 292 | 947047 | 1 - 523  | 15 - 537  |  | T79589, AI056960, AI084845, AW292063, AI368169, AI924527, AI924182, AI597567, and AW271159.   |
| HNJBL71 | 293 | 939266 | 1 - 609  | 15 - 623  |  | AI608603, AW352295, AW238519, AI767967, AW085774, AA863266, AW117932, AI310728, AA865790, AA864183, AI141812, AF081497, AF193809, and AF185277.   |
| HNJBN94 | 294 | 948996 | 1 - 738  | 15 - 752  |  | AL121756.   |
| HNJBW16 | 295 | 955920 | 1 - 542  | 15 - 556  |  |   |
| HNJCD23 | 296 | 961494 | 1 - 280  | 15 - 294  |  |   |
| HNJCH53 | 297 | 969065 | 1 - 1279 | 15 - 1293 |  | AW003768, AA148418, AI287784, AI802530, AI922026, AI620677, AA148419, and AW129759.   |

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|---------|-----|--------|----------|-----------|---|
| HNJEA92 | 298 | 955842 | 1 - 1111 | 15 - 1125 | AI828943, N23239, N27741, AI873442, AI311608, AW207380, AW292495, and AA315985.   |
| HNJEC12 | 299 | 969099 | 1 - 847  | 15 - 861  | AI097310, AI831788, AI680822, AA150619, AI681082, H21871, AA150789, H21870, H44088, AI696270, H26257, AI192339, H44023, AI767250, AA025148, and AL023582.   |
| HNJFC68 | 300 | 956178 | 1 - 483  | 15 - 497  | AA743820, AA760673, and AA883200.   |
| HNKBB44 | 301 | 955843 | 1 - 826  | 15 - 840  | AI828943, N23239, AI873442, N27741, AW207380, AI311608, and AW292495.   |
| HNKBR49 | 302 | 955844 | 1 - 470  | 15 - 484  | N27741, AI311608, AW207380, AI828943, N23239, AW292495, and AI873442.   |
| HNKBS78 | 303 | 955565 | 1 - 786  | 15 - 800  | AI828943, N23239, AI873442, N27741, AW207380, AI311608, and AW292495.   |
| HNKBV10 | 304 | 961542 | 1 - 439  | 15 - 453  | AI857688.   |
| HNKCF21 | 305 | 951659 | 1 - 1457 | 15 - 1471 | AA195092, AI805891, AW082197, AI139415, AA745263, AA744624, AA195050, AA459075, AW204020, R95745, AA278326, and AA278997.   |
| HNKCG51 | 306 | 933428 | 1 - 963  | 15 - 977  | AI954729, AI359495, N51083, AI948741, AA935553, AA779869, AA935556, AW449916, AA405449, AA664730, AI247429, AA769001, N50097, N54209, AA552736, Z38366, C14601, D59921, AI537677, AL036265, AI648663, AI439717, AI922901, AI702406, AI591316, AI554427, AI868831, AW262565, AI866608, AL043326, AI500039, AI610756, AI872711, AI682743, AI520785, AI633419, AI921248, AI491852, AI610645, AL049085, AL036361, AI498579, AI475371, AL119791, AI249257, AI273048, AI536685, AI269205, AW104724, AI624206, AI811344, AI637584, AI857296, AI926790, AI564719, AI889376, AI524671, AI274013, AI500146, AI571909, AI619502, AI802542, AI828731, AW026882, AW087445, AI862144, AI433157, AW169671, AI567128, AI702073, AW150578, AI539771, AI682841, AI560099, AI538716, AI344817, AI250293, AI636445, AL036736, AW132056, AI696612, AI890833, AL048871, AL079963, AW403717, AI690751, AI349004, AI433976, AI224992, AI539153, AI570909, AI648509, AW268220, |
| HNKDV89 | 307 | 963354 | 1 - 772  | 15 - 786  |   |

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| AI287489, AI612759, AI580240, AW103371, AI567993, AI680280, AI567351, AI554484, AW088793, AW008048, AI912866, AL045500, AI799199, AI815855, AI801766, AI702068, AI284020, AI888501, AI800453, AW168795, AW238730, AI919345, AI439745, AI859511, AI569616, AI701074, AI636456, AI536638, AI289937, AI569583, AL040243, AI274508, AI474107, AL047763, AI783504, AI620284, AI612920, AW196141, AW301409, AW078529, AI521012, AI690312, AI571551, AI570384, AW002342, AI475451, AI824557, AI702433, AI273142, AW082040, AI613017, AI572676, AI434281, AW103893, AI561299, AI269696, AI445165, AI590120, AI866002, AL036274, AI445025, AW148716, AI431975, AI679504, AI648684, AL038069, AI815232, AA835801, AL036403, AI686597, AI573032, CI6221, AW085799, AI362637, AW162071, AL121328, AI636719, AI349933, AI800433, AL038605, AI568296, AI281779, AI559296, AI497733, AI432969, AI572787, AW169653, AI921244, AL121365, AI500523, AI871697, AA640779, AW129202, AI590227, AI677796, AI269862, AL038645, AI492528, AI687065, AI612721, AL135661, AI538259, AW071349, AW149869, AW118512, AW131954, AI521040, AI567940, AW118398, AW102785, AI499131, AI285735, AI625079, AI538829, AI969601, AI866457, AI690426, AI630928, AI270707, AI275175, AI281837, AI612913, AI440239, AI271786, AI308032, AI635461, AI690480, AL036146, AI282281, AL036759, AW075351, AI684279, AW080402, AI097248, AI668893, AW080327, AI869367, AI590999, AI445432, AW148320, AI784252, AL039086, AI468872, AW129170, AW075413, AI590128, AI274541, AI500077, AI568870, AL038565, AA427700, AI590118, AI680165, AI308035, AI934035, AI580984, AI925156, I48979, AL110196, AB019565, AF113690, I89947, I48978, AL050277, AL137557, A08916, AF017152, AF113019, S68736, I89931, AF090934, AL133640, A08913, AF104032, S78214, AL122050, AF078844, AF111851, Y16645, |  |  |  |  |  |
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| AF113691, AL133075, AL050149, AL080060, X84990, AF113676, AL117460, AL050116, AF079765, AL122121, AF106862, AL080124, AF125949, AL117457, AL133606, AF113689, Y11254, AL110221, AL096744, AL050138, AF113013, AF158248, AL133565, AL122123, E03348, AL137283, AL133080, AL133016, AL050108, Y11587, AF090901, AF113677, AL133093, AF090900, AL049452, AL080137, AL137527, AL050393, AL137550, A93016, AF113699, I49625, AL133557, AF090903, AF090896, AL122093, U91329, E07361, AF118064, AF118070, AL049314, AL137459, AR059958, AF146568, AL110225, U42766, X82434, AR011880, AL049466, AF125948, AF113694, X63574, AF090943, AJ000937, AJ242859, L31396, AL050146, L31397, AF091084, A65341, AL133560, AL049300, AL049938, AF177401, AL117394, AL049382, E02349, E07108, AJ238278, AF017437, A08910, AF183393, AL049464, AL117585, AL122098, AF097996, A08912, AL117583, AF118094, AL049430, AL050024, AL137271, U00763, X70685, AF067728, A58524, A58523, A08909, AL117435, Z82022, X96540, AL133113, A77033, A77035, AL137463, A03736, U80742, AI2297, AL137648, AL133072, AL133014, I03321, AF087943, U72620, I33392, AL122110, X72889, X93495, U35846, AL049283, U67958, I42402, AL137538, AL050172, I09360, AL080127, X65873, Z72491, AL080159, AL110197, AF079763, AF057300, AF057299, E02221, X98834, A93350, AF026816, E08263, E08264, A08911, AL137523, Y14314, AL137521, AL137560, E15569, AF000145, AL133104, AF111112, I26207, AF061943, AJ012755, AL133568, AL137480, S61953, AL137556, AF095901, AF119337, AL137533, U96683, U68387, AL122049, I66342, AF185576, AC006336, AC006222, Y07905, X53587, Y09972, AR038969, AL133067, AL137526, AL080074, AF051325, I00734, AL133077, AR000496, U39656, AF026124, E00617, E00717, E00778, AL122111, AF153205, AF139986, AL110280, E05822, AC004200, AL122118, AL137476, AR013797, AR038854, I17767, AF162270, AJ006417, U49908, |  |  |  |  |  |
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|         |     |        |         |          |  | E04233, AF111849, AF003737, Z37987, AF110520, A45787, E12747, AL117432, M30514, U58996, AL117440, U78525, D83032, X62580, AL133098, A07647, AL023657, A90832, X87582, L30117, AF008439, AL137478, X92070, AF177767, AF081197, AL137429, E08631, AF067790, AC007390, AF210052, L19437, and AC006371.   |
| HOCNE77 | 308 | 832202 | 1 - 291 | 15 - 305 |  | AW291582, AW295479, AI380340, AI688604, AI660552, AI688540, AW006764, AW296326, AW004785, AA594441, AI700219, AI659950, AA470898, AA522452, AA594533, AI695451, AI581787, AI581803, and AI832419.   |
| HPASB03 | 309 | 925360 | 1 - 553 | 15 - 567 |  | AC007938.   |
| HPASD70 | 310 | 522675 | 1 - 263 | 15 - 277 |  | AA376961.   |
| HPKAA65 | 311 | 753931 | 1 - 146 | 15 - 160 |  | T20096.   |
| HROAF59 | 312 | 961784 | 1 - 449 | 15 - 463 |  | AA445950, AW044412, N59157, AW265503, H46577, AI538390, AW105475, AW337119, H18977, AW013946, H47012, AA912311, H19495, H51387, AA337340, H19075, AA443347, H46576, H19578, H23911, AA445927, H51386, AC004775, and D86957.   |
| HROAL51 | 313 | 526487 | 1 - 227 | 15 - 241 |  | AA425922, AA355281, AA482768, AA805846, AA515909, H40374, AA309196, AA828042, AA526342, H70615, AA657918, AC005081, AP000472, AC005089, AC005839, AC004854, U52111, AC012599, AP000352, AC007688, AC005256, AC005971, AL080243, AF207550, AC007878, AP001059, AP000359, AL132712, AC005776, AC007649, AL031650, AL008582, AL121877, AL023579, M33387, AC005940, Z97634, AC004016, AC005074, AL034418, AL096774, AP000302, AC005799, AC009336, AC005669, AP000550, AC006596, and AL121782. |
| HROAO26 | 314 | 531173 | 1 - 119 | 15 - 133 |  |   |
| HROAT53 | 315 | 669179 | 1 - 418 | 15 - 432 |  |   |
| HROAV94 | 316 | 963714 | 1 - 307 | 15 - 321 |  |   |
| HROBC76 | 317 | 880935 | 1 - 345 | 15 - 359 |  | AF081497, AF193809, and AF185277.   |
| HROBF58 | 318 | 735601 | 1 - 359 | 15 - 373 |  | AC007240.   |
| HROBF77 | 319 | 677615 | 1 - 373 | 15 - 387 |  |   |

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|---------|-----|--------|---------|----------|---|
| HROBM06 | 320 | 934681 | 1 - 256 | 15 - 270 |   |
| HROBQ03 | 321 | 867044 | 1 - 387 | 15 - 401 |   |
| HROBV96 | 322 | 867038 | 1 - 446 | 15 - 460 | Z98048.   |
| HROBX40 | 323 | 835594 | 1 - 332 | 15 - 346 |   |
| HROCE61 | 324 | 741263 | 1 - 327 | 15 - 341 |   |
| HRODC11 | 325 | 966298 | 1 - 276 | 15 - 290 |   |
| HRODF69 | 326 | 766014 | 1 - 335 | 15 - 349 |   |
| HRODH54 | 327 | 922899 | 1 - 446 | 15 - 460 | AW295049, and AL049610.   |
| HRODJ28 | 328 | 685922 | 1 - 592 | 15 - 606 | C14389, D80522, D80022, D80166, C03092, D81030, D80247, AA514186, D80439, AA514188, D80193, C14331, D58283, D59619, D80210, D80240, D59502, D80212, D80043, C06015, D80038, D81026, AW360811, D80157, D80219, D80195, D80391, D80164, D59859, D59787, AA305409, D59467, D51423, D80133, D51799, D59275, D80253, D80045, D80227, C15076, D80258, D80196, D80269, D59610, D80268, D80366, D59927, D80188, D51022, D80248, D50979, D50995, AA305578, C14014, D57483, D45260, D59889, D80024, D80302, D80241, D51103, D80378, AW177440, D80014, AW178893, T11417, H67866, D51759, D80251, AA809122, AW377671, AW375405, D80064, AW352170, F13647, T03116, H67854, D59503, AI525917, C14344, D58246, D81111, AW360817, AW360834, AA514184, C14227, D59317, T03269, AW178906, AI525923, C14973, C14046, D51221, AW179328, T48593, D59474, AW375406, AW378534, AW179332, AW377672, AW179023, AW178905, AW378533, AW177731, AW378528, AW178762, AW179019, AW378532, AI525920, AI535686, D58101, C14407, D59551, D80168, AW179020, AW377676, AW352171, AI525227, AI557774, AW178907, AW177733, AW178908, AW179024, D59627, AI525235, AI557751, D51250, AI525215, C16955, AW178914, AW178774, D51213, AI525242, Z33452, AI525912, T02974, AA285331, AW367950, AW177456, AI525925, AW178980, H67858, AW178986, AW179018, D45273, C14077, AW378542, C05763, Z21582, F13796, Z30160, C14298, AW178781, AW178911, AW378543, AW378525, AW378540, AW352163, AW360855, AI525237, D80314, C13958, |

|         |     |        |         |          |   |
|---------|-----|--------|---------|----------|---|
|         |     |        |         |          | AW177728, D80949, T02868, AW369651, D59695, AA305720, D31458, AI525216, AI535961, AI525228, AR060385, AF058696, A62300, A82595, A84916, A62298, AB028859, AJ132110, AR018138, AR008278, AB002449, I50126, I50132, I50128, I50133, I14842, AR054175, X67155, AR016514, AR038669, Y17187, AR060138, A45456, Y17188, A94995, D26022, A26615, AR052274, A43192, Y12724, A43190, A25909, AR008277, AR008281, A63261, AR066488, A67220, Y09669, AR066487, D89785, A78862, D34614, A30438, A70867, AR008443, AR062872, AR016691, AR016690, U46128, A64136, A68321, D88547, I79511, I82448, D50010, X68127, X82626, AR008408, AF123263, AR060133, and AR025207.   |
| HRODP45 | 329 | 717316 | 1 - 759 | 15 - 773 | D59859, D80391, D59610, D59787, D80196, D80022, D59467, C14389, D58283, D59275, C14331, D80241, D80043, D51022, D80227, D80253, D80024, D51423, D81026, D50979, D80166, D80195, D50995, D59619, D80210, D51799, D80164, D80240, D59502, D81030, D80251, D51060, D80212, D80188, D80219, D57483, D80366, D59927, C15076, D80038, AA305578, D80269, D59889, AA305409, D80378, AA514186, D80193, C14429, AA514188, D80248, D80522, AW177440, D80045, AW360811, D80439, AW178893, C14014, D80133, T03269, AW375405, D80268, AW179328, AW178907, C75259, D59373, AW377671, D80247, AW378532, AW360817, D80302, AW352117, AW375406, AW378534, AW179332, AW377672, C05695, AW179023, AW178905, AW178908, AW179012, AW179018, AW179024, AW178762, AW352170, D51759, D51250, AW352171, D80949, AW377676, AW178906, AW177731, D80157, AW179020, AW179019, F13647, AW369651, C14227, D51103, AW177456, AW178980, AW177733, AW378528, T11417, C03092, D45260, D80168, D52291, D51079, H67866, AW178914, AW378525, C14407, D81111, AW178774, AW178911, AW378543, AW352163, C06015, T48593, AW177728, T02974, C14344, D58246, D80014, H67854, D59627, AA285331, AA809122, AW178781, AW360834, D59653, C14973, AW378540, D80258, AA514184, Z21582, |



|         |     |        |         |          |   |
|---------|-----|--------|---------|----------|---|
|         |     |        |         |          | D80064, D59503, AI535686, D59317, AI525227, AW367950, AW178986, D60010, D51221, D58101, AI525917, T03116, D59474, AI525920, C14957, AI525923, C14046, D50981, AI557751, D59551, Z33452, AI525235, AW378533, H67858, AI557774, C16955, C14298, AI525242, AI525912, D51213, AW378542, AI525925, D51053, AI525215, C14077, D51231, D45273, D31458, AW360855, C05763, AA305720, AI525237, T02868, AI525222, Z30160, C13958, N66429, A62300, A62298, AF058696, A84916, AJ132110, AR018138, AR008278, AB028859, A67220, X67155, Y17188, D26022, Y12724, A25909, D89785, A78862, D34614, A82595, D88547, A94995, AR060385, AB002449, X82626, AR008443, I50126, I50132, I50128, I50133, AR054175, AR025207, I14842, AR066488, AR016514, AR060138, A45456, A26615, AR052274, Y09669, A43192, A43190, AR038669, AR066487, A30438, AR008277, AR008281, D50010, Y17187, A63261, A70867, I79511, AR062872, X68127, A64136, A68321, I82448, X64588, Z82022, AR016691, AR016690, U46128, AF123263, AR060133, and AR060382. |
| HRODV70 | 330 | 841930 | 1 - 600 | 15 - 614 |   |
| HRODX50 | 331 | 722502 | 1 - 159 | 15 - 173 |   |
| HROEA83 | 332 | 710615 | 1 - 285 | 15 - 299 | AA569577.   |
| HROEB10 | 333 | 963706 | 1 - 280 | 15 - 294 | AC002540.   |
| HSGSC41 | 334 | 576407 | 1 - 502 | 15 - 516 | AA887982, and AL096803.   |
| HSIAL23 | 335 | 508122 | 1 - 252 | 15 - 266 |   |
| HSICN48 | 336 | 524767 | 1 - 290 | 15 - 304 |   |
| HSICO48 | 337 | 529162 | 1 - 69  | 15 - 83  |   |
| HSICP51 | 338 | 531307 | 1 - 240 | 15 - 254 | AI269973, AW410346, and AB001523.   |
| HSICR32 | 339 | 507173 | 1 - 226 | 15 - 240 |   |
| HSICR69 | 340 | 531061 | 1 - 354 | 15 - 368 |   |
| HSICU08 | 341 | 960072 | 1 - 225 | 15 - 239 |   |
| HSICV54 | 342 | 575344 | 1 - 445 | 15 - 459 | AC005231, AC003108, AP000500, AL049569, AC004491, AC008079, AP000065, AB022785, AC007688, AL035587, AC006211, and AC005015.   |
| HSICV78 | 343 | 712629 | 1 - 356 | 15 - 370 | AW402031, AA363604, AI003250, AA351219, AI905092,   |

|         |     |        |          |           |   |
|---------|-----|--------|----------|-----------|---|
| HSICX21 | 344 | 531267 | 1 - 364  | 15 - 378  | AI752702; AA182508, AA045884, T31641, and AF195417.   |
| HSICY35 | 345 | 713308 | 1 - 298  | 15 - 312  |   |
| HSIDA42 | 346 | 531264 | 1 - 200  | 15 - 214  |   |
| HSIDD83 | 347 | 531260 | 1 - 453  | 15 - 467  | AA487103, and R67247.   |
| HSIDG40 | 348 | 531071 | 1 - 298  | 15 - 312  | AI074707.   |
| HSIDH73 | 349 | 531293 | 1 - 302  | 15 - 316  | AC006312.   |
| HSIDJ20 | 350 | 526993 | 1 - 322  | 15 - 336  | AA401843, and AC005041.   |
| HSIDK12 | 351 | 531255 | 1 - 300  | 15 - 314  | Z56029.   |
| HSIDO23 | 352 | 526974 | 1 - 339  | 15 - 353  | AA095552, and AC004098.   |
| HSIDP49 | 353 | 531064 | 1 - 154  | 15 - 168  |   |
| HSIDS36 | 354 | 531251 | 1 - 383  | 15 - 397  |   |
| HSIDT29 | 355 | 522341 | 1 - 316  | 15 - 330  | W27836, and AL046905.   |
| HSIDT51 | 356 | 874598 | 1 - 355  | 15 - 369  |   |
| HSIDV27 | 357 | 531246 | 1 - 305  | 15 - 319  |   |
| HSIDV70 | 358 | 925083 | 1 - 292  | 15 - 306  |   |
| HSIDV75 | 359 | 531265 | 1 - 268  | 15 - 282  | AC008040.   |
| HSIDV82 | 360 | 531297 | 1 - 276  | 15 - 290  | H66107, and H66092.   |
| HSIDW39 | 361 | 775139 | 1 - 507  | 15 - 521  | AI796110, T83017, AI796175, AW242457, AI433547, H60622, and U50545.   |
| HSIDX79 | 362 | 712026 | 1 - 404  | 15 - 418  |   |
| HSIDZ20 | 363 | 920867 | 1 - 99   | 15 - 113  | AA311162, AA295616, and AA332603.   |
| HSIEE78 | 364 | 904664 | 1 - 1374 | 15 - 1388 | D80195, D59859, D59502, D59619, D80227, D80210, D80240, D58283, D80219, D80166, D80269, D80193, D80212, C15076, D80391, D80164, D59275, D51423, D51799, D80253, D80043, D81030, D80022, D80038, D80196, D80188, D57483, D59889, D59927, D80045, D50979, D59787, D59610, D80366, D50995, D80378, AA305409, C14429, D80024, D80241, C14389, C14331, D59467, D80949, D81026, T03269, D51060, C14014, C75259, AW178893, D80134, D51250, F13647, D80268, D51022, AW179328, AW177440, AA305578, D59695, AW178775, D58253, D80168, AW378532, D81111, D80522, C14227, D51079, Z21582, AW352158, AA514188, AW369651, D52291, D80251, AI910186, AI905856, D80439, D80248, AW178762, |

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| AA514186, C14298, AW177501, AW177511, D80064, D80133, AW360811, D51097, C05695, AA285331, AW352117, C14407, AW176467, AW375405, AW378540, AW377671, AW360834, D80302, AW366296, AW360844, AW360817, AW375406, D80132, AW378534, AW179332, AW377672, AW179023, AW178905, AW179220, AW377676, AW352171, AW178906, AW352170, AW177731, D59373, D80247, AW178907, AW179019, AW179024, AI557751, T03116, AW177505, AW360841, AW179020, AW178909, AW177456, AW179329, AW178980, AW177733, AW378528, AW178908, AW178754, AW179018, D51103, D80014, AW352174, AW179004, AW179012, D58246, D80157, AW178914, AW378525, T11417, AW177722, AW177728, AW367967, C06015, AW179009, D51759, AW178774, AW178911, AW378543, AW352163, D80258, D59503, AW178983, AW352120, D59627, AW178781, T48593, C14077, D59653, T02974, AI557774, AI535686, AW177723, D58101, D51213, AW378539, AI525923, D45260, AW177508, AI535850, AW367950, AA809122, C14975, C03092, H67854, AW378533, H67866, D45273, D59317, AW177497, AW178986, AW177734, D80228, D59551, AI525917, D51221, C14973, C14344, D59474, AI525920, D60010, AA514184, D60214, AI525227, AI525925, C14957, C14046, AI525242, AA033512, AI525235, T03048, AI525912, AW378542, C16955, D31458, AI525215, C05763, Z33452, AI525237, A84916, AJ132110, A62300, A62298, X67155, Y17188, AR018138, A67220, D89785, A78862, D26022, A25909, D34614, D88547, X82626, AR025207, AF058696, AR008278, AB028859, I82448, AB012117, Y12724, X68127, A85396, AR066482, A82595, A44171, A85477, AR060385, I19525, A86792, X93549, AB002449, U87250, A94995, AR008443, AR016808, I50126, I50132, I50128, I50133, AR066488, AR016514, AR060138, AF135125, A45456, A26615, AR052274, I14842, Y09669, A43192, A43190, AR038669, AR066487, AR066490, A30438, D88507, AR054175, I18367, D50010, Y17187, AB033111, A63261, AR064240, AR008277, AR008281, AR008408, |  |  |  |  |  |
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|---------|-----|--------|----------|-----------|--|---|
|         |     |        |          |           |  | AR062872, A70867, X64588, AR016691, AR016690, U46128, I79511, D13509, A64136, A68321, AR060133, U87247, AB023656, U79457, AF123263, AR060382, AR032065, Z32749, X72378, X93535, and AR008382.   |
| HSIEH45 | 365 | 531294 | 1 - 334  | 15 - 348  |  |   |
| HSIEH84 | 366 | 531300 | 1 - 140  | 15 - 154  |  | AC005684, and AC004601.   |
| HSIEO17 | 367 | 922867 | 1 - 1872 | 15 - 1886 |  | AW381277, AW381279, T62593, AW245141, AW381280, AA827171, AW418543, AI868951, H49462, AA211485, AA579574, AW381263, AI566968, AA568661, AI078750, AA604128, AA019517, AA565823, AA644513, AI188982, T31504, Z42997, AA767424, T89930, H49463, AI948620, H97012, F22114, AI369641, AW381575, AI283644, T87152, AA748475, AA322268, H75949, AA005034, R02581, AI014302, T87057, AI961134, AI379281, T83607, AA322497, AA576177, R27657, N73865, AI254734, AA026869, AI473328, N67589, AA348159, AA129383, T83782, AA953618, H67997, AW381555, AA004420, AA007691, AW149142, AW008764, AI114471, AA425564, AW150911, Z39829, AA814308, AW383774, AW383777, AA333601, AI057250, AA004558, AA004484, AF155114, AI137520, AF176704, AI031178, and AF174597. |
| HSIEO62 | 368 | 531249 | 1 - 350  | 15 - 364  |  | AC005575.   |
| HSIFA06 | 369 | 866573 | 1 - 322  | 15 - 336  |  |   |
| HSIFA29 | 370 | 690277 | 1 - 337  | 15 - 351  |  | AC005670.   |
| HSIFC65 | 371 | 733694 | 1 - 321  | 15 - 335  |  | AA315281, and H29636.   |
| HSIFE08 | 372 | 839907 | 1 - 707  | 15 - 721  |  | AA160422, AC002992, and AC005295.   |
| HSIFE23 | 373 | 675419 | 1 - 423  | 15 - 437  |  | AC005666.   |
| HSIFE28 | 374 | 686056 | 1 - 301  | 15 - 315  |  |   |
| HSIFE46 | 375 | 718731 | 1 - 395  | 15 - 409  |  | R35280.   |
| HSIFH48 | 376 | 721310 | 1 - 436  | 15 - 450  |  | AI651548, and R55423.   |
| HSIFN66 | 377 | 742966 | 1 - 197  | 15 - 211  |  | AA577787.   |
| HSIFP22 | 378 | 674018 | 1 - 370  | 15 - 384  |  | AI135254, AB011096, and AC002094.   |
| HSIFR56 | 379 | 733024 | 1 - 406  | 15 - 420  |  | AC004537.   |
| HSIFS23 | 380 | 919109 | 1 - 287  | 15 - 301  |  |   |
| HSIFV95 | 381 | 836996 | 1 - 500  | 15 - 514  |  | AA190789, AW419467, AA307361, F11811, Z43375, and   |

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|---------|-----|--------|---------|----------|---|
| HSIFW89 | 382 | 771820 | 1 - 294 | 15 - 308 | AB018289.   |
| HSIFW94 | 383 | 765203 | 1 - 386 | 15 - 400 | AF060568, and AC001234.   |
| HSIFX92 | 384 | 968352 | 1 - 250 | 15 - 264 | AC005084.   |
| HSIFZ21 | 385 | 670415 | 1 - 372 | 15 - 386 | AA077494, and AC004983.   |
| HSIFZ51 | 386 | 919096 | 1 - 258 | 15 - 272 | D44645, and Z68280.   |
| HSIGA08 | 387 | 866568 | 1 - 307 | 15 - 321 |   |
| HSIGA28 | 388 | 686047 | 1 - 260 | 15 - 274 | AA078252, AC004893, AF076974, and AF110377.   |
| HSIGA33 | 389 | 701963 | 1 - 302 | 15 - 316 |   |
| HSIGD07 | 390 | 952508 | 1 - 311 | 15 - 325 |   |
| HSIGD94 | 391 | 961040 | 1 - 219 | 15 - 233 |   |
| HSIGF11 | 392 | 866552 | 1 - 423 | 15 - 437 |   |
| HSIGG58 | 393 | 735682 | 1 - 422 | 15 - 436 | AA977598.   |
| HSIGG95 | 394 | 795631 | 1 - 333 | 15 - 347 |   |
| HSIGH52 | 395 | 726384 | 1 - 237 | 15 - 251 |   |
| HSIGJ45 | 396 | 718728 | 1 - 345 | 15 - 359 |   |
| HSIGL56 | 397 | 906942 | 1 - 584 | 15 - 598 | AA633962, AI821281, AA574402, and AA573653.   |
| HSIGL94 | 398 | 769754 | 1 - 167 | 15 - 181 |   |
| HSIGM43 | 399 | 716259 | 1 - 514 | 15 - 528 |   |
| HSIGM67 | 400 | 751278 | 1 - 421 | 15 - 435 |   |
| HSIGO07 | 401 | 893712 | 1 - 308 | 15 - 322 |   |
| HSIGO67 | 402 | 751262 | 1 - 394 | 15 - 408 |   |
| HSOAT94 | 403 | 537505 | 1 - 138 | 15 - 152 |   |
| HSOAW33 | 404 | 702709 | 1 - 372 | 15 - 386 |   |
| HSOAW39 | 405 | 866228 | 1 - 221 | 15 - 235 |   |
| HSOBF59 | 406 | 738861 | 1 - 297 | 15 - 311 | H79007, AC005233, AL022476, AC007114, AC007262, and AC005488.   |
| HSOBF65 | 407 | 747484 | 1 - 340 | 15 - 354 | AA749152, AI915081, AA482928, F31867, F31811, AA018923, R70883, Z23147, AI653783, AA862029, W96277, AA775205, AA012829, AI185394, N73060, AA664126, AW089950, AA020873, AA303049, AA579427, AW372037, H91062, AA523695, AI567391, AI674290, AW265688, AA324918, AA568314, AW419389, AA632765, AI619994, T94072, H68343, AA936718, AA579281, AA768179, AI471467, AA568204, |

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| AA570740, AA483606, AW408596, AA683069, AA722336, AI367551, R70884, AW440451, AA837771, AA452325, AA425924, AA056248, N86089, AA558366, F00533, R81176, H15241, AA736488, AI271762, AA582746, AW007424, AI816537, T76994, H40478, T83057, AA111870, AA297496, AI815583, AA071045, H67172, F35684, AI969639, AA553337, AI733717, H91358, AI680547, AI446561, AI217131, AA340153, AW162303, AA077637, AI298079, T65733, AL048002, AW162047, AA351808, W96522, AI343169, AW161786, AA502532, AA315361, AI753536, AA937809, N23241, AA719523, AI445774, AA502443, AW338021, AA302661, AW338035, AA626595, AA368329, AW117723, AI049955, H84412, AA086435, AL135363, AA610433, AI366098, AL042373, T79607, AI697242, AA715284, AA715344, AI312090, AA715527, AW088133, AI312784, AA715962, AA320105, AI345334, AA583547, AI668566, AI889579, W63553, AA069255, AI370170, AW002831, AW130350, AA633039, AI891080, AA635433, AC005516, AL022238, AC005237, AF031078, AF030876, AL022327, AL109952, AC006449, AP000688, AP000337, AC005225, AP000215, AC005678, AL139054, AC006011, AF111168, AC005531, AC005873, AC006084, AP000326, AC004686, AP000169, AP000054, AP000122, Z81365, AL049776, AL035249, AC009501, AP000090, AL049766, AC003664, AC005839, AC004991, AC002420, AL049795, AB003151, L44140, AL109758, AC000353, AC006538, AC005488, AC007371, AL049829, AC000025, D87675, AC005972, AL096703, AL031602, AL049869, AC004999, U80017, AC002477, AC005874, AF134471, AC007308, AL008720, AL121603, AC007156, AC002470, AC003982, AL049757, Z93017, U47924, Z98941, AL035086, AC004019, AL031427, AC005071, Z85996, AC005081, AC005015, AL050318, AC002400, Z98950, AF118808, AL133353, AC004948, AF064861, X87344, AL031685, AC004211, AP000510, AC005808, AL133448, D86995, AC005821, AC005099, Z98749, AC005971, AC002978, |
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|   |     |        |         | AL021878, AC005778, AC005527, AC005529, AC006581, AL022311, U89337, AC005702, AP000511, AC007406, AC005585, AP000689, AC004832, AL136295, AC006071, AC005480, AC002996, AC005844, AL049548, X55503, AL031432, AC007537, AL121593, AC000082, AC005562, U07807, AL133246, AP000501, AC005746, AC004217, AC004050, AD000092, AP000065, AC004381, AC005209, AL031281, AL024508, AC012085, AC007349, AC009330, AC005666, AC005067, AF124523, AC004841, AC006254, U91318, AL032821, AP000142, AC003070, AL035071, AB023050, AC004254, AF190465, AL034553, AC002301, AC004655, AC007388, Z94056, AC008928, AL079340, D43727, AL132987, AC007030, AC007751, AL133162, Z74021, AC005632, AC004816, AC004383, AC005399, M19364, AL035685, AF001549, AC006409, AL022726, AL035410, Z97192, AC000003, AC002044, AP000700, AC005932, AL049570, AC008064, Z98048, AC005318, AP000034, AC005037, AC004821, I89273, AC006211, AC007041, AL031848, AP000348, AL035400, AL122020, AC005952, AL132712, AC006023, AL137705, AL023879, AC002511, AF001548, AC005409, Z54073, AC007363, AL022323, AC000052, AL031289, AC006014, AC007533, AC012384, AL031673, AL031732, AC002314, AC008545, AC008044, AL031284, Z98884, AL133445, AP000553, AD000813, AC002492, AC003967, AC020663, AP000513, Z82184, AC004890, AC007387, AC005011, AC005014, AC004024, U43572, AC005736, AP000049, AP000116, AB020859, AL021394, M84472, U34879, AC002985, AC006050, AC004985, U93305, Z77249, AC004453, AC006141, AL078477, AL022326, AL109963, AL021546, Z80232, AL031276, AC007563, AP000311, Z94801, AC004653, and AL031431. |
| HSOBL03   | 408 | 923317 | 1 - 276 | 15 - 290  |
| HSOBL58   | 409 | 735589 | 1 - 309 | 15 - 323  |
| HSOBL59   | 410 | 738858 | 1 - 142 | 15 - 156  |
| HSOBL77   | 411 | 771729 | 1 - 503 | 15 - 517  |
| C06015, D80391, D59787, D80196, D80038, D80193, D80022, |     |        |         |   |

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| <p>D51022, D80253, D80268, D58283, D51423, C14331, D80247, D80043, C14389, D80366, D80157, D80522, D80439, D59859, D80212, D59275, D80166, D80195, D59467, D59619, D80210, D51799, D80164, D80240, D80227, D59502, AA305409, D80045, D81030, T11417, D81026, D80269, D80188, D80248, D50979, D80219, D50995, D80302, D59610, D57483, D59927, AA305578, C15076, C14014, D80024, D51060, D59889, H67866, D80133, D80251, C14227, AA514186, AA514188, AW360811, D51103, D80378, C14429, AW177440, D45260, D80241, D59653, D51759, AW178893, H67854, C03092, D80258, T03116, AW377671, AW375405, T03269, D81111, C75259, D58246, D59503, AA809122, D80014, C14973, C05695, AW366296, AW178906, D80064, AW360844, AW360817, A1525923, F13647, D58101, AW179328, T48593, AW375406, AW378534, AW179332, AW377672, AW179023, AW178905, AW177731, D59474, AW378528, AW178762, AW179019, C14344, D59373, AW378532, AW360834, AA514184, A1525917, C14407, AW378539, D59317, AW177501, AW177505, AW177511, AW378533, AW352170, D60010, AW179020, D51221, D59551, AW377676, AW352171, T02974, AW179024, A1525235, AW178907, AW177733, AW178908, A1525920, C14046, A1535686, D80168, D51250, AW360841, AW352120, A1525227, C14957, A1557751, AW178775, AW367950, AW178909, C16955, D60214, AW177456, AW179004, AW179329, AW179018, AW178980, A1557774, AW178986, Z33452, AW178914, AW178774, AW178754, AW176467, AW352158, H67858, AW352117, D45273, A1525222, C14298, A1525242, D59627, A1525912, Z21582, AW177734, AA285331, A1525925, AW179009, AW179012, A1525215, AW178911, AW378543, AW378525, D51213, AW378540, AW177722, AW352163, C05763, AW378542, AW177728, AW178781, C14077, D51053, T02868, AW360855, AW369651, D51079, A1525237, D59695, D52291, D80949, Z30160, C13958, C04682, D50981, AA305720, D51231, D31458, A1525228, N66429, A1910186, A1525928, D80314, A1525216, T03048, A1525238, A1525239, A62300</p> |  |
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| HSOBQ06 | 412 | 934666 | 1 - 394 | 15 - 408 |   |
| HSOBQ14 | 413 | 719796 | 1 - 524 | 15 - 538 |   |
| HSOBQ82 | 414 | 779093 | 1 - 312 | 15 - 326 |   |
| HSOBZ60 | 415 | 739915 | 1 - 196 | 15 - 210 |   |
| HSODB93 | 416 | 785711 | 1 - 539 | 15 - 553 |   |
| HSODO56 | 417 | 835876 | 1 - 241 | 15 - 255 | AW162986.   |
| HSODT01 | 418 | 915544 | 1 - 410 | 15 - 424 | U91327.   |
| HSODZ10 | 419 | 963671 | 1 - 356 | 15 - 370 | AC007685, Z85987, and AP000961.   |
| HSODZ58 | 420 | 731545 | 1 - 604 | 15 - 618 | W88862, W88757, N71557, AA025083, AA634227, AA319218, AA501600, AA077817, AI830390, AA715609, AI707788, AI216799, R89436, AA747480, F12535, AA558697, AA747276, AW440810, AC005412, AP000555, AC004034, AP000359, AC000379, AL021918, AF055066, X54156, U94788, AC002312, AC006030, AL034549, AP001037, AL031685, AL049759, AP000553, AC004620, AL117344, AC004895, U95740, AC008372, AC004647, AL022316, AC002565, AC004134, Z82244, AL035413, AP000356, AC006001, AC007193, Z60589, AC009516, AC000052, AC005696, AC005971, AC006254, AL035681, AC004019, AC005250, Z97054, AC002559, AL034429, AL049569, AC005212, AL080243, AC004941, L78810, AL049636, AL135744, AC002352, AC005632, AL008629, AC006255, AC006441, AL132987, AC004866, AL031311, AL031589, AC004000, AC005081, AC005690, AC009501, AC007688, AC002350, AP000967, AC005527, |

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| HSEOC07 | 421 | 952397 | 1 - 323  | 15 - 337  |  |   |
| HSPAF44 | 422 | 761986 | 1 - 536  | 15 - 550  |  |   |
| HSPAK46 | 423 | 968901 | 1 - 426  | 15 - 440  |  |   |
| HSPAL44 | 424 | 754600 | 1 - 284  | 15 - 298  |  | AI024323, and AI687282.   |
| HSPAM95 | 425 | 918857 | 1 - 107  | 15 - 121  |  |   |
| HSPAP89 | 426 | 775813 | 1 - 546  | 15 - 560  |  |   |
| HSPAQ91 | 427 | 789887 | 1 - 469  | 15 - 483  |  | AI141763, W22527, and AC005962.   |
| HSPBG79 | 428 | 771630 | 1 - 461  | 15 - 475  |  | AC006032, and AL133512.   |
| HSPBL63 | 429 | 727687 | 1 - 915  | 15 - 929  |  |   |
| HSPBM18 | 430 | 786056 | 1 - 724  | 15 - 738  |  |   |
| HSPME73 | 431 | 915722 | 1 - 1227 | 15 - 1241 |  | AW377298, AW377335, AW377370, AW377300, AW377374, AW367852, AW377257, AI922500, AW377264, AA927738, H11886, AI970471, W69888, T81701, AA576526, AW406239, AI199486, AA989195, AW377389, AI123218, AI091150, AA922738, W69567, AW418802, R16877, AI560660, AI612820, AA807380, AA991853, R71372, AA468875, T81488, H11524, AI538103, AW367837, AW377365, AA742404, AI084549, AJ131890, AF161019, AF176099, AJ131889, and AC003694. |
| HSPMG03 | 432 | 920267 | 1 - 615  | 15 - 629  |  |   |
| HTNTD72 | 433 | 870030 | 1 - 556  | 15 - 570  |  | AI653992, and AA640885.   |
| HTPAA30 | 434 | 509812 | 1 - 169  | 15 - 183  |  | AA294989, and AA385977.   |
| HTPAC06 | 435 | 960791 | 1 - 352  | 15 - 366  |  | AA386049, and AC005099.   |
| HTPAF01 | 436 | 961063 | 1 - 333  | 15 - 347  |  | AA386101.   |
| HTPAG78 | 437 | 773936 | 1 - 374  | 15 - 388  |  | AA294887.   |
| HTPBH46 | 438 | 522888 | 1 - 300  | 15 - 314  |  | AA295670, and AA295753.   |

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| HTPBQ47 | 439 | 922777 | 1 - 430 | 15 - 444 | AA746310, W20421, R87627, N24299, H43805, AI139901, R92659, AI817040, and AA743934.   |
| HTPBT55 | 440 | 509264 | 1 - 290 | 15 - 304 | AA295440.   |
| HTPCD84 | 441 | 783263 | 1 - 77  | 15 - 91  |   |
| HTPCK55 | 442 | 732458 | 1 - 129 | 15 - 143 | AA481290, and AB020867.   |
| HTPCN85 | 443 | 529760 | 1 - 207 | 15 - 221 |   |
| HTPCO32 | 444 | 973306 | 1 - 455 | 15 - 469 |   |
| HTPCR51 | 445 | 526406 | 1 - 253 | 15 - 267 | AA294864.   |
| HTPCS70 | 446 | 529766 | 1 - 353 | 15 - 367 |   |
| HTPCT55 | 447 | 592481 | 1 - 330 | 15 - 344 | AC005844.   |
| HTPCT67 | 448 | 573704 | 1 - 338 | 15 - 352 | R20786, AA947456, and AC006356.   |
| HTPCT82 | 449 | 869886 | 1 - 352 | 15 - 366 |   |
| HTPCV62 | 450 | 573698 | 1 - 383 | 15 - 397 |   |
| HTPCV73 | 451 | 573686 | 1 - 371 | 15 - 385 |   |
| HTPCW69 | 452 | 935946 | 1 - 360 | 15 - 374 |   |
| HTPCZ07 | 453 | 953769 | 1 - 129 | 15 - 143 |   |
| HTPDI16 | 454 | 830553 | 1 - 199 | 15 - 213 |   |
| HTPDJ03 | 455 | 924789 | 1 - 499 | 15 - 513 | AA150807, AW341449, and AF110184.   |
| HTPDJ94 | 456 | 669158 | 1 - 365 | 15 - 379 | W51842, AW274826, AA410499, AA455588, AW237158, AA220243, AA503778, AA399512, AI925610, AW015854, AW014435, AI081239, AI688411, AI921582, H68676, and AD000671.   |
| HTPDK32 | 457 | 699457 | 1 - 274 | 15 - 288 | AW293772, AW293513, N71206, N22003, AI613520, AA651939, and F04456.   |
| HTPDS34 | 458 | 526416 | 1 - 392 | 15 - 406 | AA386113, AA992843, and AL031053.   |
| HTPDS85 | 459 | 541837 | 1 - 111 | 15 - 125 | AI469516, AA640006, AI560514, AI310606, AL043326, AW409630, AI249946, AI474093, AL049053, AI568060, AA617645, AI419894, AI559752, AI798359, AI962906, AI698491, AI538850, AI349814, AI452857, AL040100, AI702065, AW104767, AW411351, AW079656, AA806181, AL035847, AI252789, AI267282, AI611215, AI335363, AW090225, AI570389, AI343748, AA574323, AW129592, AI597748, AW020932, AI208112, AI680442, AA808311, AI433198, AI635813, AA768725, AI866078, AI654137, F34677, |

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|         |     |        |         |          | AI972473, AW084097, AI684080, AI491852, AI886277, AI540789, AL043052, AI591046, AI862146, AI620841, AI783569, AI685822, AW193465, AI630474, AI922540, AA583439, AL117590, I09202, E01356, AF029750, AL133636, U96683, X62773, AJ001838, U87620, AF199027, AL117693, E01357, S54890, Y11030, AB025103, I66342, U75604, AR016469, AL133070, Z49258, AB014082, AF110521, AL122121, AL080086, AL117626, X79406, U36585, A32826, A30330, A32827, A30331, AF022813, AL109672, AR012379, AL133653, AJ003118, AL117443, AL133085, AL080060, AR016802, A90848, Y18680, AJ131826, J05032, AF113676, AL137294, AL137476, AL049761, AL034400, AC006160, AF141976, and AC005091.   |
| HTPDT70 | 460 | 573727 | 1 - 298 | 15 - 312 |   |
| HTPDU59 | 461 | 973279 | 1 - 438 | 15 - 452 | AW193472.   |
| HTPDV73 | 462 | 912947 | 1 - 738 | 15 - 752 | AA280368, AA278898, AA459431, Z78022, and AL049685.   |
| HTPDW56 | 463 | 573706 | 1 - 87  | 15 - 101 |   |
| HTPDW62 | 464 | 965356 | 1 - 442 | 15 - 456 | AA564423, and D14480.   |
| HTPDZ94 | 465 | 660751 | 1 - 329 | 15 - 343 | AA386054, AA100947, AA805935, F07271, AA491106, AA513876, AI962961, R18747, W24282, AA005348, AA705196, AA827410, AA631773, AW452742, AA650378, T70092, AC007877, AC003035, AC005250, AB014088, L11910, AC004190, AP000516, AL008710, AC002487, AL022401, AP000962, Z95325, AC007312, AC003083, AL121654, AP000069, AL023876, AC007751, AJ010395, AL078600, AP000360, AF017732, AC000053, AL050309, AL049591, Z82216, AC004865, Z82203, AC002060, AF121948, Z70041, AL022575, U40455, AC006314, AF128893, AL132800, AC004800, AC006054, AC005061, AL049545, AC006042, AC006379, AL031387, AC005833, AF036938, U82696, AL020989, AL035552, AC005144, AP000493, AL034410, AL049843, AL035067, AC005229, AL136297, AL122023, AL031985, AL117354, AC008498, Z82170, AL033397, AC003001, AC002357, Z98746, Z84719, AL109620, AC006151, AC004992, U09822, AC004070, U69730, Z69721, AC004890, |

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| HTPEH20 | 466 | 573667 | 1 - 379 | 15 - 393 | AC002524, AC004910, AC004038, AC007363, AF130351, Z92846, AL022098, Y10196, AL050334, AF067846, AL121782, AC007750, AL109613, AL049744, AC006197, AC004023, AF198099, AL049633, AC002990, AL121652, and AP000526.   |
| HTPFA05 | 467 | 869865 | 1 - 342 | 15 - 356 | AA393545, and AL117356.   |
| HTPFD02 | 468 | 974295 | 1 - 342 | 15 - 356 | AL035588.   |
| HTPFI35 | 469 | 874323 | 1 - 392 | 15 - 406 | AW392083, and AA279019.   |
| HTPFJ95 | 470 | 933120 | 1 - 450 | 15 - 464 | AA295234.   |
| HTPFM01 | 471 | 914956 | 1 - 446 | 15 - 460 |   |
| HTPFM04 | 472 | 926728 | 1 - 510 | 15 - 524 | AC005013.   |
| HTPFN90 | 473 | 926462 | 1 - 311 | 15 - 325 | AC005035.   |
| HTPFQ07 | 474 | 869785 | 1 - 371 | 15 - 385 | AA236404, AW249340, AW175870, AA191032, U01062, and D26351.   |
| HTPFS01 | 475 | 914908 | 1 - 327 | 15 - 341 |   |
| HTPFW04 | 476 | 926537 | 1 - 426 | 15 - 440 | AC005214, and Z56559.   |
| HTPFX77 | 477 | 961059 | 1 - 420 | 15 - 434 | AA295074.   |
| HTPFY31 | 478 | 869839 | 1 - 554 | 15 - 568 | AW364673, AW364675, AA837627, AI039309, AI498381, and F23225.   |
| HTPFY43 | 479 | 869844 | 1 - 581 | 15 - 595 | AA292418.   |
| HTPFY73 | 480 | 906905 | 1 - 591 | 15 - 605 | AA563747, AA295109, AA295211, AI205010, AL038498, AW104793, AI889566, AI499301, AI298061, C18550, AI829233, AA662740, AW162288, H09744, F12561, AI431434, AL078593, U95742, AC004690, AP000503, AL133245, AF088219, AC005519, AL033521, AL033377, AC006459, AC005875, AL133445, AL049795, AP000555, Z78022, AC007225, U62317, AC004675, AC008989, AL021877, Z86061, AL022316, AC007216, AC006277, AC000134, AC007023, AC005279, and AP000117. |
| HTPFZ03 | 481 | 922755 | 1 - 413 | 15 - 427 | R96427, AA582746, AA488903, AA411590, AA091982, AA856817, AW085790, N63755, T83057, AA579188, AA487720, AA363003, AI676249, AA553535, AC004967, AC007225, AC002077, AC005778, AL031680, AC005409, AC005082, AF134576, AC002563, AC006480, AC005348, AC005746,   |

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| HTPGD19 | 482 | 869842 | 1 - 543 | 15 - 557 | AL031730, AL049847, and AL049846.   |
| HTPGE28 | 483 | 974302 | 1 - 622 | 15 - 636 |   |
| HTPGF79 | 484 | 974301 | 1 - 447 | 15 - 461 |   |
| HTPGG12 | 485 | 969538 | 1 - 527 | 15 - 541 | AA295087, T82270, AA325128, and AC008013.   |
| HTPGK10 | 486 | 963169 | 1 - 325 | 15 - 339 |   |
| HTPGL49 | 487 | 974015 | 1 - 379 | 15 - 393 |   |
| HTPGR61 | 488 | 869802 | 1 - 303 | 15 - 317 | W19793, AA359208, D31508, AW027675, AI926840, AA961052, AI872593, and AI187329.   |
| HTPGW12 | 489 | 969522 | 1 - 398 | 15 - 412 |   |
| HTPHD53 | 490 | 869795 | 1 - 419 | 15 - 433 |   |
| HTPHE36 | 491 | 869814 | 1 - 587 | 15 - 601 | AL035086, AF053356, and AL049694.   |
| HTPHG90 | 492 | 914955 | 1 - 519 | 15 - 533 | AC005189.   |
| HTPHI08 | 493 | 958077 | 1 - 342 | 15 - 356 | AA295500, AL008734, AL109807, AB026899, AP000500, M29874, AC023172, and AC004617.   |
| HTPHK06 | 494 | 975310 | 1 - 517 | 15 - 531 | AI821881, AI821918, AA338904, AW277171, AI469599, AA501906, AA838190, AI560085, AI932599, AI254913,   |

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| HTPHR76 | 495 | 869791 | 1 - 1028 | 15 - 1042 | AI075178, AA331929, R55412, AA233754, AA315432, and AA233753.   |
| HTPHS37 | 496 | 960637 | 1 - 324  | 15 - 338  |   |
| HTPHT28 | 497 | 952088 | 1 - 448  | 15 - 462  | AI859675.   |
| HTPHV17 | 498 | 926455 | 1 - 262  | 15 - 276  |   |
| HTPIC25 | 499 | 975319 | 1 - 560  | 15 - 574  | D80268, D80212, D80157, and AC005146.   |
| HTPIE48 | 500 | 911422 | 1 - 300  | 15 - 314  | AC005954.   |
| HUFAA81 | 501 | 777951 | 1 - 430  | 15 - 444  | AI792377, AI860747, AA668905, AA719433, T59285, AI188382, AI926089, F32213, AW009653, AA827383, AA747977, AI754105, AI755214, AA077247, AI754567, AI271762, H73550, AL046519, AA811954, AI687972, AW151870, AA420723,   |



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| N33587, AA904211, AA609834, AA504951, AW068853, AA678616, AA828764, AL047467, AI249688, AA297496, AL118612, AW068580, AI537108, AW193523, AI928890, R98835, AA503298, AA197019, AI859906, AL041682, AL041815, AI476460, AI524022, AI473671, AI954464, AA557984, AI811319, AA077052, AW128881, AA313133, AA569194, AL037927, AL041681, AI826761, AA662989, AA657910, AW367942, AW105463, AI018029, AW270429, AL044489, AA659333, U91321, AC003037, AL031602, Z95331, AC007285, AL035658, AC006059, AC005041, AC005788, AC006101, Z86090, AL022311, AC005372, AF088219, AC002425, AB003151, AC007934, AC004491, U82668, AC004000, AC005399, AL035461, AL080243, AL109623, AC007052, AC004675, AC007151, U91326, AL133448, AC004760, AF039954, AC007021, AC005952, AL021154, AC005082, AB018249, AL035457, AC008072, AL031132, AC005841, AL049694, AL049692, AC009247, AL035089, AL035659, Z93016, AC005102, AL020997, AL135746, AC005971, AC005736, AC002073, Z98941, AC005527, AC004796, AC010206, U78027, AC004805, AL008715, L78810, AP000690, AC005696, AL021394, AC005015, AC006026, AC004662, AC006084, AL022326, AC006388, AL031003, AC003957, AB023049, AC004895, Z81364, AC005776, AC004234, AC004790, AC006285, AC006080, U52111, AC005291, AP000065, AL031666, AL031005, AC006512, AP000314, AC005206, AL031651, AC007546, AC005529, AC004257, AF205588, AP000355, AC005920, AC005378, AC004099, U02052, AC002528, AC006014, Z98044, AL034420, AL035249, AC005320, AL031774, AC005822, AC005369, AC005704, AC005667, AC006537, AC007707, AC003029, AL031594, AP000557, AP000194, AL096701, AC011331, AL096791, AC005488, AL035405, AL031722, AL121825, AL049569, AB020863, AC004217, L48038, AC007773, AC005355, AF165926, AC005678, AP000115, AL031672, AC004167, AC016831, AL022313, AC002316, AC006071, |  |  |  |  |
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|         |     |        |         |          | AF207550, Z98051, U96629, AP000694, Z93942, AC007666, AC007298, AF176815, AC007308, AL031121, AL009183, AC005695, AC004125, AC002312, AF049895, AC006117, AC006254, AC005895, AC004466, AC005057, AC006064, AC004797, AF129756, AC002994, AC004263, AF196779, U95740, AC006449, AC005632, AL031431, AJ229041, AC005486, AL109852, AP000300, AC007160, AC006049, Z83826, AC004216, AL022327, AC003043, AF064861, AF001550, AC002369, AC005180, Z98743, AL021453, AL031670, AL034429, AL050350, AL133163, AL109984, AL031295, AL049757, AL035422, AC006251, AC004584, AC001228, AL035455, AC007240, AC004686, AC005193, Z93930, AL031668, AJ246003, AC006088, AP000513, AC007676, AC007066, AP000689, AC002314, AL035691, AP000114, AL049745, Z99716, AL022322, U80017, AC005484, Z98048, AL050307, D87675, AC005512, AC005231, AC005049, AJ011930, AC005089, AL031680, AC018633, AC002492, AP001052, U47924, AL034555, AC007731, AP000553, AC005937, AL133500, AC000025, Z93017, AC005510, AC007191, AL031427, AL024507, AC004876, AF196969, AC005500, AC002551, AC005839, AL031848, AC004999, AC006515, and AC007686. |
| HUFAC65 | 502 | 750264 | 1 - 371 | 15 - 385 | AL133640.   |
| HUFAG81 | 503 | 966223 | 1 - 619 | 15 - 633 |   |
| HUFBJ29 | 504 | 690591 | 1 - 428 | 15 - 442 |   |
| HUFAL90 | 505 | 788868 | 1 - 116 | 15 - 130 |   |
| HUFAN64 | 506 | 678677 | 1 - 383 | 15 - 397 |   |
| HUFAP02 | 507 | 919805 | 1 - 455 | 15 - 469 | AI933645, and AF153821.   |
| HUFAU25 | 508 | 678024 | 1 - 424 | 15 - 438 | AA121153, AI678550, R96565, AA433828, AI651396, AI653046, AW362668, AI917104, AI653259, AI339183, and AC009721.   |
| HUFBA27 | 509 | 966256 | 1 - 653 | 15 - 667 |   |
| HUFBN27 | 510 | 868997 | 1 - 388 | 15 - 402 | AL037024, AA132389, AA808742, AA360846, AA666254, F01992, AA689351, H92729, AA360127, C05714, AW270329, N57969, F27846, AI682665, AI382324, AI926183, H64988, AW079664, AA947269, AI814739, AA603530, AI865807,   |

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|  |  |  |  |  | <p>             AW068316, AA608751, AA639946, T54275, AA621838,<br/>             AI266003, AI753113, AI054333, W42997, AI358928, AI361063,<br/>             AI525532, AI354847, AJ230815, AA573207, AA702326,<br/>             AI369977, H86105, AA618035, T71936, AW340905, AW070900,<br/>             AA486785, AA559023, AW407473, AI355414, AW022734,<br/>             D29168, H53169, AA228442, AA584594, N23229, AA292227,<br/>             AA399158, AW275763, AA633920, AA515905, AA298531,<br/>             AA094109, AA508509, AI925579, AI828331, H68563,<br/>             AA483599, AA225652, AI801771, AW247866, R86240, Z99364,<br/>             AI061313, AA262500, AW103632, AA948726, AI281818,<br/>             AW342029, AW419126, AA628606, AI075935, T96417,<br/>             AA055601, AI679945, AI679435, H88666, AW167431, N69688,<br/>             AI808229, AW089625, AL079649, AI378057, AI002467,<br/>             AA779023, AI169870, AA877693, N76766, AI923838,<br/>             AA984187, AI134669, N31818, AL036283, AI914883,<br/>             AI143051, AL041515, AA631359, AA322052, R62615,<br/>             AA151880, AA228505, T92665, H49810, FI7549, AA372507,<br/>             AA452906, AI870091, T80500, AA291179, AA665645,<br/>             AA128057, AA847099, AA346355, AA345202, AA525127,<br/>             AW176023, AA528490, AW062684, AA128014, AI254485,<br/>             AW302048, AW439605, AA947265, AI873854, AW089952,<br/>             AA225630, AA653612, AI815759, AA225498, AA225171,<br/>             R87547, AA679532, AA809589, AA434538, AA165390,<br/>             AA747226, AA630535, D29424, AA420494, AA586407,<br/>             AI627887, N95099, N69125, AI985795, N22850, AI963816,<br/>             AA074774, AA828579, C75485, AA532423, AW189456,<br/>             AA664197, AA761885, AA923595, AI367887, AI636730,<br/>             AW082432, AW243787, C75602, H58883, FI8568, R02089,<br/>             AI004189, AI002734, I34600, AC004231, AB009817,<br/>             AC003029, AC006315, AFI90465, AC005909, Z99704,<br/>             AC004539, AC005625, Z97630, AL096755, AC005841, U78027,<br/>             AL021579, AL023656, AL023773, AC004706, AC004827,<br/>             AL031432, AL035422, AL035409, AC004648, AC004914,<br/>             Z84484, AC005702, AL024509, AL022316, AC005483,<br/>             AC006116, AC007347, AC008012, AC008173, AC004125,           </p> |
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| AL049839, AC002429, AC005031, AL008636, AC005385, AL049692, U80017, AC003682, AC006928, AF108083, AL023804, AD000092, AC004765, AC005486, AC006160, AC005768, AF053356, AC004474, AC002531, AC005355, AF008196, AC006115, AL110120, AL031803, AC005905, AL133546, AC005532, AC004999, AC006536, AC005332, AC005015, U50537, Z84480, AP000355, AC008124, AF045533, X57103, M15958, AF081786, M10935, AL023576, D63861, Z82245, AF048728, Z83001, AF217403, Z82184, U75931, M69197, AC002314, AC006132, AC004602, AF036405, Z75888, AC007746, AD000671, AL023694, AL022237, AP000279, U62293, AL035494, AL031255, AC005363, AC007999, Z75887, AL008726, Z93244, AC004924, AC004486, AL109946, AL031686, AC002383, AC004935, AP000038, AP000106, AP000130, AP000208, AP000142, AP000131, AP000209, L05367, AC004996, AC005300, AC002558, Z98172, AF124523, Z85987, AC002404, AC004974, AL035587, Z95116, AL079340, AC002551, AC002996, AP000247, AL049745, AL049760, AC004222, AP001068, AP000090, AC006084, Z93017, AL050338, AC007243, AL022396, AL034429, AC005484, AC005005, AC002504, AC004848, AP000469, AC003083, AC004820, AC002430, AC004859, AC007971, AP000248, AC005670, AC002367, AC006285, AC007388, AL008627, AC007676, AC004062, AL031682, AC012099, AF064865, AL079304, Z98884, AC004821, AC002070, AC002350, AC007546, AC007649, AC007384, AC006064, AC002454, AC006992, AC011331, AC005696, AC005297, AC006538, AC007277, AL133238, AP000344, AC006369, AC004682, AC005971, AC006946, AL135744, AL049869, AC005725, AC005291, AC000134, AC005323, AC005274, AC005736, AF109907, AC006211, U91321, U47924, AC004526, D87675, AJ011930, AL022333, AC002448, AC007204, AC006539, AC004990, AL050318, AL035413, AC000056, AP000565, AL109798, AP000065, AL024508, AL022318, AC007066, Z78893, AC005602, AC003973, AC005145, Z82176, AC007192, |  |  |  |  |
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|         |     |        |          |           | AL022315, AC005049, Z84474, AL049611, AF196972, AC004895, AC002451, AC006120, AC012085, U91324, AC008080, AC002492, AF111169, AC009498, U67815, AC004148, AL023807, U25956, AB014079, AL133246, AC006277, AC006139, AL096703, AC005183, AL033533, AC002316, AP000502, and AP000514.   |
| HUFBU14 | 511 | 868993 | 1 - 457  | 15 - 471  |   |
| HUFBU41 | 512 | 712256 | 1 - 485  | 15 - 499  | AA731833, and Z85996.   |
| HUFBU61 | 513 | 741770 | 1 - 361  | 15 - 375  |   |
| HUFBV27 | 514 | 683030 | 1 - 521  | 15 - 535  | AW173065, AI216330, AC005829, AC005332, Z82195, and AC004694.   |
| HUFDB55 | 515 | 950430 | 1 - 2157 | 15 - 2171 | AI732436, AA579242, AI954628, AI763064, AA053424, AI493412, AW134526, AA534814, AI967966, AA053043, AI992267, AI342785, AI304542, AI913775, AI864467, AI733752, AW376406, AI134524, AI142134, AL038983, AI037727, AL039643, AL041347, AL039432, AI037443, AL037343, AL037335, AL037436, AL037323, AL049018, AL038838, AL041238, AL047012, AL044125, AL047170, AL040463, AL047219, AL044162, AL040193, AL040621, AL043538, AL047183, AL043496, AL040464, AL041324, AL045817, AL041098, AL040119, AL037435, AL041133, AL044186, AL041096, AL038822, AL040625, AL038532, AL040322, AL041163, AL038761, AL047057, AL040075, AL040617, AL040510, AL044037, AL040149, AL041358, AL041296, AL043467, AL041346, AL041086, AL045684, AL041197, AL041752, AL041246, AL040576, AL043923, AL043814, AL043677, AL041635, AL040839, AL043845, AL041233, AL040294, AL045753, AL043492, AL041602, AL040553, AL046442, AL044064, AL041459, AL044074, AL040472, AL041577, AL040444, AL041292, AL040052, AL041730, AL041523, AL043627, AL041277, AL041159, AL041374, AL041955, AL046850, AL040768, AL040155, AL043848, AL043570, AL042135, AL046994, AL046914, AL045328, AL041142, AL039316, AL046392, AL044272, AL045671, AL045989, AL041168, AA327091, AL045920, |

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|         |     |        |          |           | AR038762, A11245, A02135, A04663, A02136, A04664, Y16359, D78345, I08395, A58524, A58523, I62368, AR031566, A85395, AJ230972, A85476, E03627, I66495, I66494, AJ244003, AJ244004, AJ244005, I66487, A90655, A93016, I44681, I03331, I00682, I08051, X83865, A86792, AF082186, A98767, A20699, E14304, A77094, A77095, A11623, E00609, A11624, E00696, AR031488, I13521, E00697, A81878, I52048, A93963, A93964, A27396, I63120, A95117, I49890, I44531, A11178, E01007, AR037157, AR054109, A64973, E03813, A25909, A91965, A24783, I44516, A24782, A70040, I66482, AR009151, I66485, I66483, I66484, E16678, A82653, AR038066, AR027099, E16636, AR051652, Y09813, AR038855, U94592, AR051651, E12584, AR008429, AR064706, D17247, A93923, Y11449, AR051957, I01995, A93916, Y11447, I25027, I26929, I44515, I26928, A98420, A98423, I26930, I26927, A98432, A98436, A98417, A98427, AJ231028, D13316, AR022273, A81671, AR069079, D50010, AB025273, A70869, A93931, A70872, X81969, Y11458, A22734, E17098, AB026436, A85203, A133053, A122101, I19525, A133074, AR054110, A06631, and AJ230845. |
| HUFGH78 | 516 | 659722 | 1 - 508  | 15 - 522  | AA016040, AI457214, AI815197, AW080795, AI963562, AI921206, W22418, AI635935, AF040639, AI035413, AF026947, and Y16675.  |
| HUVDJ10 | 517 | 886207 | 1 - 2009 | 15 - 2023 | AA426634, AA127735, AA424855, AA121510, AI110760, AL079812, AL046457, AA680243, AL121235, AA806796, T63501, AW440545, AI732120, AA453558, AL138265, AI284640, AL079869, AA846568, AI679782, AI313166, AL119331, AW088846, AL046409, AA569648, AL043009, AL037050, AW276817, AA373672, AI805363, AW081165, AW303196, AA521323, AW301350, AA521399, AI431303, H71429, AI270117, AI307608, AI708009, AI986165, AW023672, AW274349, AA490183, AI016704, AW193265, AI610920, AA744021, AW072923, AA577824, AI565581, AW102811, AW265170, AL041690, AI963720, AA640277, AA129446, AW407578, AA581903, AI041013, AW265393, AI564496,  |

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| AA938105, AI133164, AI754955, AI345681, AI246119, AI345675, AI345654, AW088616, AA491814, AW269488, AA877817, AI471572, AA524821, F36273, AL119691, AI110770, AI254316, AI151261, AI254615, AW342042, AL042420, AW088202, AA501809, U51704, AW028429, AI805547, AL044858, AA682912, AI061334, AI307201, AI200051, AW339568, AL048925, AI890348, AI350211, AA846876, AA468131, AA774222, AI754253, AI334443, AW162049, AI613280, AI929531, AW029038, AL042753, AA531372, AW247819, AA679936, AI471481, AW075511, AW276827, AI799642, AI865905, AA583955, AI298710, AI962050, AA515224, AL045053, AA665330, AA661948, AW265009, AI143242, AA340747, AI339850, AI754658, AI085719, AA618412, AI375710, AA553666, AL046205, AI679045, AW438643, AA722372, AI619997, AI358343, AA984708, AI168185, AI282832, AI792287, AW166815, AW168433, T40452, AI688846, AI625244, C06327, AA531580, AW276435, AW021583, AA482711, AI951863, AW338086, AI251436, AI537955, AB014606, AC005412, AC004815, AC005785, AL096791, AL031427, AL021154, AC006064, AC003982, AC002301, AC008372, AL133448, AC005632, AC006946, AC005081, AC005484, L78833, AC003684, AC005527, AC005057, AC005332, AF053356, AC005220, AL117694, AC005531, AC004812, AC005778, AL133353, Z93930, AC005231, AC007011, AC005037, AC004876, AL034430, AC006277, AC002400, AC000025, AL096703, AL022476, AC002316, AC006468, AC005696, AC004638, Z84469, AL049766, AL022326, AC006271, AF001548, AC005821, AL022238, AP000557, AL096701, AC004841, AC005013, AC005520, AC004448, AL121653, AC006430, AC006132, AF030453, AC005914, AL078581, AC005399, AL035587, AF129756, AC005031, AC004662, AC006285, Z99716, AP000553, Z85987, AC005562, AF207550, AC002350, AF196779, AC004814, AL023575, AC000353, AC005529, AF001549, Z93241, AC009516, AC006071, AC004882, U96629, |  |  |  |  |  |
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|         |  |  |  |          | AL117352, AF067844, AC004000, AC005839, AL049759, AC002091, Z98051, AL078463, AC004531, U82828, AL031680, AC006088, AC004929, AL020993, U91326, Z83822, AL049780, AC005971, AC007227, AC006547, AC006057, AC016830, AC009247, U80017, AC005519, AC002425, Z68870, AC003104, AC004675, AC003108, AC006449, AC000026, AC000035, AC004883, AB023049, AC005678, AC016027, U47924, AC004699, AC004990, Z98742, AC004099, AC005763, AL031281, AF196969, AC000159, AC003029, AC007686, AC005049, AF088219, AL034549, AC002477, AC004832, AC005011, Z98036, AC002544, Z94056, AL022328, AC007637, Z74739, AL031255, AC005288, AC002073, AC005844, AL109627, AC007536, AC006146, AL031283, AL034420, AC006130, Z84480, AC005274, L44140, AC004253, AL022322, AL109984, AC002565, AL035588, AC005514, AC004477, AL023803, AC004858, AC004967, AC005747, AP000501, AC007298, AF045555, U95740, AP000359, AC002128, AC004851, U95743, AC002059, AC007055, AP000689, AC005902, AC007845, AP000503, AC005324, Z92845, AC005089, AC002310, AL021391, AC006312, AC004804, AL024498, AL121578, AL031848, AF024533, AC007546, AL035458, Z94801, Z83845, AC005920, AC004859, AC002347, AC006160, AC005695, AC005913, AC006026, AC005043, AL117258, AC003070, AL031005, AL133163, AL031602, AC007263, AL035659, AP000432, AC005488, AC004913, AP000556, AC004526, Z86090, Z98200, Y07848, AC007664, AC005901, AC004150, AC007199, AL022329, Z83826, AL049776, AC007993, AL022336, AL050321, AC005740, AC003037, AC004382, AC002369, Z97056, AC004033, AL049869, AL031657, AC005071, AL021393, AF042090, AF134726, AL035461, AC005295, AC002365, AL034379, AC005102, AL031670, and Z98752. |
|         |  |  |  | 15 - 529 | AI819354, AI560690, AI393635, AI580846, AI024796, AI242427, AI393644, AW020098, R40205, AA568464, F08882, AI190763, AA121140, AA059294, H72102, H92545, N74993.   |
|         |  |  |  | 1 - 515  |   |
|         |  |  |  | 915732   |   |
|         |  |  |  | 518      |   |
| HVAAE01 |  |  |  |          |   |

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|---------|-----|--------|---------|----------|---|
| HVAAE94 | 519 | 968675 | 1 - 332 | 15 - 346 | and AF097994.   |
| HVACL61 | 520 | 868572 | 1 - 511 | 15 - 525 | AA844907, AA845137, and AA367039.   |
| HVAEM04 | 521 | 940469 | 1 - 80  | 15 - 94  | AI122764, AW276493, AI288219, AI401500, and N74545.   |
| HVAET61 | 522 | 965365 | 1 - 684 | 15 - 698 | AW135375, AA989283, AI914257, AA886747, AI420461, AI047042, AI064830, AI121270, AI436456, AI045500, AW268253, AI500553, AL036396, AI868831, AW117882, AI349772, AL135661, AI349645, AI207510, AW162071, AI815383, AI863014, AW071349, AI433976, AI687376, AL046849, AI120854, AI119049, AI120736, AL036802, AI349614, AI433157, AI580190, AI906328, AW166645, AA613907, AW080838, AI690751, AI119791, AI920968, AI909666, AI119748, AL047763, AI907070, AI969601, AI340582, AL036759, AI349598, AL036146, AI309401, AI251485, AW132121, AI149592, AI909662, AI500077, AI345111, AI624859, AW303152, AA640779, AI679724, AW238730, AI687415, AI608667, AI349256, AI684265, AI567351, AI345860, AI469532, AI907061, AI567632, AI799305, AI568870, AW302965, AI934036, AI343059, AI343112, AI813914, AI560012, AI349933, AL040169, AI220734, AI345744, AI682106, AI969567, AL040243, AI687728, AI521012, AI275175, AI702406, AL036274, AI538716, AI686926, AI673256, AL121365, AW074993, AW103371, AI889203, AA528491, AW089572, AI873731, AI334902, AI440426, AA528822, AL036980, AI312152, AI753683, AI344182, AW087445, AI349937, AI349004, AA603930, AI631107, AI687362, AI818683, AI499393, AI682743, AL036240, AW274192, AI866608, AA938383, AI282655, AI609592, AI690835, AL038605, AW235035, AA585422, AI678302, AI620284, AA572758, AW301409, AI475371, AI857296, AI307466, AI285735, AI366691, AW071417, AI583316, AI281779, AI907056, AI366549, AI919058, AI597918, AW195957, AI250293, AL038778, AI345735, AI697137, AI499463, AI439087, AW068845, AI635461, AI886532, AI590128, AI758437, AI635942, |

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| AI699857, AI671679, AI281773, AI564719, AI340519, AW169653, AI440239, AA528529, AI696846, AI800433, AI568854, AI446606, AI636456, AI445432, AI498579, AI625079, AI702433, AL048871, AI497733, AI612913, AI255071, AW148320, AI597750, AI540832, AI613017, AL049085, AI249257, AL038779, AI348897, AI610307, AI866780, AI800453, AW301300, AI500659, AI312428, AI525064, AW074869, AI307558, AL045903, AI680113, AI590482, AI874109, AI633419, AI866002, AI952114, AI539771, AI568855, AW268768, AI475134, AI889839, AI628205, AI269696, AL036247, AI499131, AI224992, AL043326, AI687375, AI866887, AI570384, AW167776, AL121014, AI682841, AI800411, AI921379, AL036260, AI811845, AI934035, AI493248, AA523030, AI271786, AI434281, AI862142, AW168591, AI818206, AI610645, AL042753, AA508692, AI492540, AL047041, AI432229, AI609580, AI469811, AW026610, AI811863, AI282281, AW302992, AI282903, AI281762, AI318569, AI580984, AI349226, AI591311, AI754897, AI561254, I48979, AF078844, AL050393, Y11587, AF090900, AL137527, AF090934, AL133016, AL133640, AF118064, S78214, AF113013, AF113691, L31396, L31397, AF118070, AF125949, AF090943, A93016, AL049938, AL050146, AL080060, AL110196, AL117457, AJ242859, AF113690, AF090901, A08916, AF104032, AL133606, AF090903, AL117460, AL049452, AF113694, AC004738, AL110221, S68736, AF113676, I89947, AL122050, AR059958, AF113689, AF106862, AF090896, I89931, AL050149, AL049430, X84990, U42766, A08913, AL096744, AL050108, AL050116, AB019565, AL133075, AL049314, Y16645, AF113677, AL122093, AL049466, AF017152, AF113019, AL137283, AL080137, AR011880, AL050277, AL122123, AL133557, AL133080, AF113699, E03348, I48978, AL080124, AL133093, E07361, X63574, AF097996, AC005992, X82434, AL137557, AL133565, AL122121, AF158248, U91329, AL137459, AL022147, |  |  |  |  |  |
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|         |     |        |          |           | AF111851, AF146568, Y11254, AJ000937, AL117394, AC002464, E05822, AL050138, AF091512, AF091084, AC004686, AF125948, AL110225, AF079765, E07108, AF177401, U00763, AL117585, AL137550, I49625, AC004690, AC007390, AL117583, AF017437, AC004093, AC006371, A65341, AL133560, AC002467, AF067728, E02349, AF061943, S61953, AL049464, AC007298, AL049300, A08910, AL117435, AL049382, U95739, AJ238278, A08912, AC007392, AL050024, AC005291, AL035587, X70685, I33392, U72620, AL122110, A03736, AL035067, AL096776, Z82022, AC007458, A58524, A58523, A08909, AC005886, AC010077, L78810, X72889, AF183393, AC006501, AL122098, AL133113, A77033, and A77035. |
| HVAFD06 | 523 | 933527 | 1 - 742  | 15 - 756  | AI904859, AI904856, and AW270009.   |
| HVAHA06 | 524 | 933531 | 1 - 330  | 15 - 344  | AA148771, W44346, T72825, N62122, AA304792, AA005210, and H14135.   |
| HVAME35 | 525 | 968676 | 1 - 1194 | 15 - 1208 | AA844907, AA845137, AA367039, and AA367020.   |
| HVAMW07 | 526 | 951733 | 1 - 453  | 15 - 467  |   |
| HVAND08 | 527 | 958443 | 1 - 364  | 15 - 378  | AA694346, AF181721, AB032980, and AL133043.   |
| HVANR45 | 528 | 930308 | 1 - 593  | 15 - 607  | AA824393, AW004051, AA812593, AI200988, AA845110, AA835130, AA367324, AW290955, AIS39772, and AL042508.   |
| HVAOG11 | 529 | 966135 | 1 - 848  | 15 - 862  | N25812, AW392670, AW372827, AL119483, U46349, AL119319, AL119363, AW363220, AW384394, Z99396, AL043029, U46351, AL119355, AL119457, AL119324, AL119443, AL119484, AL119391, AL119444, U46350, U46347, AL119497, AI142137, AL134524, AL119496, AL134528, AL134538, AL119439, U46341, AL042965, U46346, AL119341, AL037205, AL119335, AL134920, AL119522, AL134531, AL042984, AL134518, AL119418, AL119396, AL119399, U46345, AL042970, AL042975, AL042614, AL134542, AL043011, AL043019, AL042544, AL043033, AL042450, AL042542, AL119304, AL043003, AL119464, AL042551, AR060234, A81671, AR066494, AR054110, AB026436, and AR069079.                         |
| HVAOK04 | 530 | 925932 | 1 - 477  | 15 - 491  | AI221399, AI471995, AI467898, AI950299, AI095934,   |

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|---------|-----|--------|----------|-----------|---|
|         |     |        |          |           | AI034059, AI431317, AA662934, AW327457, AA746600, AI128230, AA025525, AI286104, AI742307, AI160162, AI720824, AI809949, AI669783, AI431319, AI50927, R19215, AI244940, AI090194, AI741975, AA028934, AW043889, AA876265, AA860575, AA844331, AI803250, AA876346, AI245572, AI095557, AI480029, AW393929, AI189306, AI992258, AA044743, T55337, AI122798, AA335548, U56654, AA932576, R13183, AI497894, AA668506, AA564849, AI866853, AI432084, AW272239, AW150208, AI572774, AI270663, AA669015, AA044797, AW157607, AA487470, AA194396, AI825990, AA731264, AA768549, AW129224, AW157188, and AL034345.  |
| HVAOW86 | S31 | 965298 | 1 - 1034 | 15 - 1048 | N25431, AI669981, AA809138, AA854642, AW241780, AI636296, N25553, AI768827, AA962150, N34122, AI478713, N34151, R88992, H99894, R68206, R68207, and R86350.   |
| HVARE86 | S32 | 965243 | 1 - 487  | 15 - 501  | AI889955, AI913228, AI066470, W46957, C01207, AI470293, AI247298, AW020397, AI702527, AI886124, AI801793, AI888671, AI249946, AI929108, AI538850, AW084097, AI887620, AL037454, AI925404, AA088789, AW088944, AL110306, AL038529, AL135025, AL045413, AW085350, AI687568, AI623389, AW023338, AW008737, AI590043, AI866082, AW058233, AI873638, AW268261, AI345415, AW104056, AI471429, AW161098, AI537991, AI624956, AI282376, AI624971, AI161278, AI873604, AI687166, AI539847, AW021717, N29277, AI244380, AI539153, AI936003, AI335363, AI539057, AI560679, AI685211, AI913452, AA808175, AW083573, AI887430, AL042488, AI458443, AI890391, AI261589, AI473528, AW082600, AI570264, N57346, AI628325, F27788, AI805598, AW168031, AI473434, AI631216, AI685080, AI473451, AW149227, AI432570, AL079799, AI440284, AI583578, AI355277, AI613449, AI352514, AI344785, AW059713, AI679069, AI541056, AW262983, AI800370, AI916419, AI718513, AI689614, AI500061, AI289791, AI521005, AW051088, AI289310, AA806719, AW104062, AI469516, AL048323, AW160916, AI698391, |



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| AL137271, A08913, AL110224, E02221, A15345, S63521, AB026995, AF183393, S83440, A08912, AL137479, A08910, S83456, S78453, AF126247, A08909, A07588, I09360, AF192557, AL122100, S69510, AL137533, AL122121, A08907, AL050277, I89931, X66862, A86558, A65341, I48979, A08908, AL122098, AL110221, S76508, AF167995, A08911, I49625, AL133067, AL137554, AF081571, AL133049, AR038854, AF113694, AL122050, AL122123, I89934, AL049464, X82434, L04852, L19437, AL137712, L31396, AL137555, S78214, AL117587, AF112208, AF047716, I09499, AF199027, AF004162, A57389, AF067728, AL133640, X80340, AF210052, AB025103, AL122045, X99717, AJ003118, AF039138, AF039137, I32738, AF008439, Z97214, X72889, I30339, I30334, EI5582, AL117463, AL049460, AF113699, AF111851, AL080074, AF094480, U49434, A90832, U42766, AL117629, U36585, AL137548, I00734, AL110159, AL137429, AF036941, AF118094, AF132676, AF107847, Z72491, AF061836, AF118092, U95114, AL137538, AF151109, AL050149, E00617, E00717, E00778, AL133014, X72387, U77594, A58524, A58523, AL080124, X81464, AF111112, AF119337, Y16258, AL122049, Y16257, E02756, Y16256, A65340, L13297, AR038969, AJ238278, AF090900, AF090903, I66342, AF146568, AL050155, AL137294, X93495, D16301, AF106862, AF000145, AF081197, U72620, AF081195, D83032, A17115, A18079, AF115410, E02914, AL080060, AF113677, AL049339, X56039, AF089818, AF017152, A08916, U00686, AF040751, AL133077, AF090901, AL137527, AR068182, AL110222, I68732, A93016, AC004200, I89944, A21103, AL049382, AF115392, U58996, AF200464, AF111849, AL133062, AF106657, A12297, AL133619, U89295, AF026816, AR068753, A30330, A30331, L10353, X87582, E05822, AL137478, AL122118, AF176651, AL137476, AR059958, U68233, I92592, AF113676, U62966, X65873, AF079765, X63574, E15569, AL137537, AL137539, AL117648, U92992, AL137556, AJ000937, L40363, AF067420, U57715, I42402, A93350, M27260, AL137641, U75370, AL137480, |  |  |  |  |  |
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|         |     |        |          |           |  | X62773, U51587, X53587, I29004, X66417, E12747, AL050170, and AR029580.   |
| HWGAG91 | 533 | 773364 | 1 - 272  | 15 - 286  |  | AA689293, and AA804485.   |
| HWGAC19 | 534 | 668126 | 1 - 409  | 15 - 423  |  | AC006101.   |
| HWGAC45 | 535 | 754792 | 1 - 313  | 15 - 327  |  | AA262164, N27049, AA491312, AA143186, AA346611, N48382, AA333620, Z28515, T81958, and AB014536.   |
| HWGAE55 | 536 | 974955 | 1 - 484  | 15 - 498  |  |   |
| HWGQD52 | 537 | 726390 | 1 - 98   | 15 - 112  |  | AA437169, and AB018307.   |
| HWGQF79 | 538 | 882611 | 1 - 438  | 15 - 452  |  |   |
| HWLAL74 | 539 | 761974 | 1 - 288  | 15 - 302  |  |   |
| HWLBI74 | 540 | 839518 | 1 - 422  | 15 - 436  |  | AL035425.   |
| HWLBJ06 | 541 | 934614 | 1 - 431  | 15 - 445  |  | AI123402.   |
| HWLBK76 | 542 | 731099 | 1 - 515  | 15 - 529  |  | AA193193, and AI609548.   |
| HWLBK80 | 543 | 933865 | 1 - 534  | 15 - 548  |  | D42047.   |
| HWLCV54 | 544 | 929742 | 1 - 443  | 15 - 457  |  | AL139054.   |
| HWLDO22 | 545 | 838721 | 1 - 434  | 15 - 448  |  | AI733811, AI640317, AI916600, AA757207, AI732839, AA745673, AI792633, AI264658, and AW196083.   |
| HWLED58 | 546 | 830330 | 1 - 431  | 15 - 445  |  |   |
| HWLEF86 | 547 | 785193 | 1 - 138  | 15 - 152  |  |   |
| HWLEH06 | 548 | 934649 | 1 - 542  | 15 - 556  |  |   |
| HWLEH47 | 549 | 709376 | 1 - 408  | 15 - 422  |  |   |
| HWLEI16 | 550 | 729050 | 1 - 316  | 15 - 330  |  |   |
| HWLEJ07 | 551 | 952396 | 1 - 396  | 15 - 410  |  | AB023217.   |
| HWLEK39 | 552 | 918545 | 1 - 359  | 15 - 373  |  | AI823397, and AI817711.   |
| HWLEN08 | 553 | 958509 | 1 - 1758 | 15 - 1772 |  | AI655644, AW327476, AI031969, AI205174, AI188440, AW119015, AW004593, AI863261, AA594110, AI346704, AI090352, AW361848, AW117393, AI148841, AW084108, AW327477, AI613225, AI192097, AA598697, AW130228, AW005953, T80227, AW195717, AA442259, AA883126, AA160298, AA456223, W86369, AA291990, AI360945, AI916226, AA047326, N68259, AI587282, AA831041, AI028392, AA411013, W40265, H94896, AA923081, W86305, W26837, AI680635, AA836337, W40218, AW205315, AA568678, AA781825, AA293214, AI356302, R96627, AA055222, |



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|---------|-----|--------|---------|----------|---|
|         |     |        |         |          | AA226768, AA442258, T62832, H86977, N80952, AA770355, Z45232, H86512, H85815, R59107, AA552570, AA192495, R59108, AA666262, R96669, AA160234, AA191312, AI216152, AA190905, H91048, AA772996, H86978, AI139475, AA341301, AI016968, N26373, H86974, AI439636, AA130830, AI041372, AA375826, H85352, H91340, H54207, H86979, H54206, Z42208, H86975, N56352, R64241, AI004396, AI560452, AI125549, H86489, AA368539, H63675, T62681, AA227002, AW238831, AA883749, AW292020, R77078, AI694430, H86976, AA580656, AA380444, AA846465, F08344, and AI561352.   |
| HWLEN20 | 554 | 963418 | 1 - 423 | 15 - 437 |   |
| HWLEO59 | 555 | 974078 | 1 - 390 | 15 - 404 | AA773463, AI634187, AA828637, AW069227, AI457313, AW023111, AI216990, AW338035, AW338021, AI791211, AI821947, AA804943, AI753267, AI636341, AI243789, AA630854, AI216151, AI755214, AI754567, AW245354, AA284247, AI493587, AA086318, AI889579, AI554807, AA502532, AA515728, AA757426, AI754105, AA634991, AI356440, AA456924, AI206841, AI884340, AA501461, AW272294, AI249365, AI249688, AI568683, AA225406, R92658, W02749, AI038304, AA775205, AI445216, AW151201, AI537800, AI821382, AI224619, AI042373, AA557911, AI961983, AA535216, AI821931, AI417469, AI569100, AA857812, R34070, AI189682, AA832145, AW192599, AW083678, AI278972, AI199816, AI292236, AA626829, AI205181, AI118925, AA609834, AI049709, H73550, AA573127, AI912401, AI187148, AA491767, AA297195, AI538236, AI042771, AW303872, AI620992, AI799569, AI042906, AW002831, T47138, AA054156, AW151870, AI119838, AC004590, AC005736, AC005225, AC005071, AC005015, AP000114, AC005409, AC004491, AC006312, AD000092, AC007277, AC005778, AC010205, Z83844, AC002511, AC005972, Z83847, AC004686, AI034423, AC007011, AI021453, AI049795, AC007227, AI080243, AI035410, AP000046, AP000553, AC007664, AC004673, AC007371, AC005305, AC005049, AC007040, AC006121, |

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|         |     |        |         |          |  | AR036572, U91328, AC005520, AC002288, AL049539, AC015853, Z93023, AC006071, AC005216, AC003119, AP000032, Z93017, AL133445, AL034402, AC007686, AJ251973, AL049712, AC005514, AP000500, Z82244, AL020997, AL031670, AC005632, AC004878, AC002375, AC007388, Z97630, AC005358, AC007304, Z82182, AC007308, AL022326, Z98200, AC004099, AC005800, AP000501, AC005005, and AC004771.   |
| HWLEP95 | 556 | 751199 | 1 - 475 | 15 - 489 |  |   |
| HWLEQ36 | 557 | 966250 | 1 - 437 | 15 - 451 |  |   |
| HWLEQ81 | 558 | 934224 | 1 - 210 | 15 - 224 |  | AA625092, and AL022328.   |
| HWLER88 | 559 | 915168 | 1 - 320 | 15 - 334 |  |   |
| HWLFB08 | 560 | 849136 | 1 - 580 | 15 - 594 |  | AL133245, AL133243, and Y17267.   |
| HWLFC80 | 561 | 830279 | 1 - 571 | 15 - 585 |  |   |
| HWLFE50 | 562 | 830283 | 1 - 580 | 15 - 594 |  | AW085982, AI521525, AI269608, AW020150, AI926102, AW151541, AI537368, AL041375, AI452836, AA484892, AW275432, AA535216, AW117860, AI797998, AI927275, AI755214, AI754567, AA487569, AA302979, AI984168, AI049845, AI754105, AI004591, AI801563, AI587349, AI249688, AI751341, AI884383, AI921706, AA644090, AA456924, AI355246, AA610381, AW003886, R94909, AI753904, AI697235, AA610433, AI434653, AI973173, AA410788, AA086318, AW151247, AI697239, AW021917, AI862716, AI697242, AI568376, AA833896, AA669234, AW104161, AI446623, AA228778, AI141130, AW057760, AA833875, AA703818, AA846923, AI421257, AA761623, AW277174, AI357762, AI291037, AW270768, AI915081, AW083678, AA643441, AC007617, AC007216, U95742, U95739, AC007537, AP000032, AC006511, AC007226, M63543, AC006965, AC006455, AC005288, AC007563, M63544, AC005529, AC012085, AC004020, AC005839, AC006449, AC009516, AP000689, Z85987, AI023575, AI049776, AC007450, AP000350, AC005082, AP000501, AI050307, Z97054, AC006530, AC005971, AC002544, AC005755, AC005231, U91326, AC005911, AL109963, AC007327. |

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| AC007664, AL078581, AC005015, AC004526, Z82203, AC007406, AC009509, AC007225, AC004491, AC006312, AP000556, AL035587, AC005527, U91318, AC004236, AC005332, AL096791, AC005377, AL022302, AC002310, AL132712, AP000692, AC002126, AC006946, AC005736, Z93020, Z83844, AL109758, AC002477, AP000502, AC007308, AL031427, AL024474, Z93241, AC005399, AL024498, AC007227, AC002472, AP000252, AL109798, AP000103, AC006285, Z98884, AL133163, Y18000, AC002350, AL049872, AP000558, AC005484, AF003626, AC005669, AC003043, AF196969, AC004805, AF053356, Z83840, AL022165, AC004383, AC005081, AC004522, AC006241, AC006141, AC004033, AC000025, AP000046, AL009179, AC007676, AC006011, AC004106, AC006026, Z84487, AC004962, AL022238, AL022311, U78027, AC005261, AL021707, AC006509, Z99716, AL121603, Z98742, AC005701, AL023656, AC005740, U85195, AC005694, AP000065, AL050318, AC005412, AC002369, AC005324, AL031311, AL096763, AC004771, AC005696, U95743, AF111169, AC004148, Z93023, AE000658, AL135744, AC006441, AC005726, AC007637, Z96074, AC007358, AC005037, AF196779, AC004991, AC005500, AC003085, AP000500, AC007041, AL133448, AC005562, AC005920, AC002425, AL022323, AC006840, AL109801, AC005041, AC005668, AL035555, AL117337, AL121653, Z84469, AC005089, AP000555, AC005899, AL031053, AC002420, AF165926, AC006538, AC006111, AC002492, AC002319, AL049569, AC003663, AC007546, U52112, AC003035, AC000353, AC005358, AC005829, AC003657, U95740, AC002511, AC003029, AC008085, AC005229, AC002470, AC007066, AC004895, AL050333, U82828, AP000553, AC006023, AL022329, AC005076, AL049538, AP000270, AC005365, AL031681, AC006079, AC007201, AC004552, AF207550, AC003982, Z84466, AF205588, AC003006, AC005537, AC006101, AC007536, AP000031, AC004865, AL020997, AL031848, AL022327, |
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|         |     |        |         |          | AL133245, AC020663, AL050321, AC002456, AC003108, AL031662, AC004834, AP000159, AJ003147, AL117354, AC005338, U96629, AL121658, AC005531, AF045555, AC006211, AL022326, AL080243, AC008041, AC005088, AC003992, AP001053, AC004841, AC005245, AP000550, Z86090, AL024507, AF031078, AC006571, and AC005049.   |
| HWLFF40 | 563 | 830287 | 1 - 286 | 15 - 300 | AC005751.   |
| HWLFF62 | 564 | 915155 | 1 - 437 | 15 - 451 |   |
| HWLFH47 | 565 | 719752 | 1 - 467 | 15 - 481 | Z99396, AW392670, AW372827, AW384394, AW363220, AL119355, AL119341, AL119497, AL119319, AL042551, AL119457, AL119324, AL119396, U46341, AL119443, AL119484, AL119363, AL119391, AL119522, AL119483, AL119335, AL119496, U46351, U46349, AL036418, AL038837, U46346, AL119399, AL134902, U46350, U46347, AL134528, AL037051, AL119444, AL036725, AA631969, AL119418, AL134518, AL042614, AL037205, AL119439, AL042433, AL042984, AL042975, AL036858, AL042965, AL134920, AL119401, U46345, AL134536, AL043008, AL042450, AL134525, AL134538, AI142131, AL039074, AL036924, AL042970, AL042544, AL043019, AL039912, AL043029, AL119488, AL042542, AL038509, AL043003, AL119464, AL037085, AL037094, AL037082, AL037526, AL036196, AL036190, AL037639, AL037077, AL036767, AL038520, AL036268, AL036998, AL038851, AL036733, AL037027, AL037615, A81671, AR060234, AR066494, AR054110, AB026436, AR023813, AR064707, and AR069079. |
| HWLFJ51 | 566 | 853602 | 1 - 328 | 15 - 342 |   |
| HWLFK50 | 567 | 918539 | 1 - 288 | 15 - 302 | AA131248, and AI288287.   |
| HWLFO70 | 568 | 756554 | 1 - 389 | 15 - 403 | AC005595, U47924, AC005531, AP000347, and AC005754.   |
| HWLFO82 | 569 | 779461 | 1 - 494 | 15 - 508 |   |
| HWLFO92 | 570 | 791052 | 1 - 577 | 15 - 591 |   |
| HWLFP37 | 571 | 708985 | 1 - 598 | 15 - 612 | AI284640, AL046409, AW327868, AA584145, AI754955, AI431303, AI963720, AA490183, AL044858, AL119691, AA507824, AL037683, AW193265, AI334443, AA581903, AA846876, AI270117, AI613280, AI281881, AW265385,   |

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| AW303196, AA521399, AA521323, AA623002, AW274349, AA847499, AW301350, AW439558, AI076616, AI350211, AA493708, AW270382, AW021583, AA525824, AI345518, AA584201, AI754658, H71429, AI499938, AL042753, AA533036, AA126450, AA613232, AA984708, AW274346, AA682912, AA719292, AI110770, AA503473, AA502104, AA528516, AA483771, AI110760, AW072923, AL042420, AI568678, AA584167, AA632837, AA631507, AI246119, AI434695, AI732120, AW080811, AI254615, AA394271, AI860013, AI133164, AA613227, AA470969, AA491814, AL038474, AA468131, AA649642, AI610159, AW304584, AI536665, AA572713, AA603835, AI246796, AA720702, AW073470, AI192631, AI589230, AA780515, AI357288, AA177063, AI499503, AA084624, AA469451, AI133297, AI801591, AA531372, AA665199, AI561060, AW103758, AW276827, AL048626, F36273, AI064864, AA494163, AA713891, AA129446, AI312309, AI696955, AI379719, AA602047, AA551503, AA577906, AA806796, AA548058, AA828042, AI624097, AI633390, AI368256, AA552856, AA552843, W79504, AA214342, AW148792, R88888, AI801600, AI564185, AC005529, AC005527, AC007298, AC005694, AC006251, AC006312, AC002476, AC003071, AL121748, AL121603, AC004854, AL022313, AC004686, Z97054, AB020865, AL109967, AC004381, AC004975, AL080243, AP000088, AC004890, AC005837, AC006213, AC005772, AC004650, AC002310, Z68870, AL031286, AL080250, Z97989, AC006960, AL031311, AC004987, AC007919, AL034402, AC008372, Z82976, AC004019, AC002430, AC004859, AC004815, AC002425, AL139054, Z98752, AP000557, AC003108, AC004755, D87675, AC006211, AL049758, AP000555, AC007384, AC016026, AC005412, AC005324, AC005295, AC005751, AC006449, AC001231, AC004076, AL049839, AC003048, AC005531, AP000065, AL009172, AC007899, AC007731, AL121578, AC003983, AC002045, AC005154, AL031584, AC005500, AC005081, AC008115, |  |  |  |  |  |
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| AL049869, AC005037, AL031848, AL080242, AC007216, AC010168, AL023575, U47924, AF196971, AP000552, AL021578, AE000658, AC007066, AC007790, AC008079, AP000692, AC007688, AC003664, AC005189, L44140, AC005562, AC004990, AC007285, AC020663, AC004526, U91323, AC002400, AC002059, AL049643, AC000052, U95742, AC007563, AC002549, Z86061, AF111168, AL021453, AC005839, AC002429, AC005944, AC005520, AF165926, AC005914, AC005180, AC006006, AC006450, AC005747, AF001549, AC016830, AB022785, U91321, AC004033, AC006111, AC004796, AL136295, AL049759, AC005535, AC007283, AP000359, U80017, Z93020, AL008719, AC006026, AC004638, AC007032, AL035413, AC006344, AL133245, AL031670, AC008012, AC006486, AC010072, U66059, AC005768, AC007842, AL031577, AL050318, AC009946, AJ010770, L78833, AC005486, AL132985, AP000961, AL121694, AC004933, AC008109, Z98051, AL049776, AC006064, AL049709, AC009399, AC000025, AC003007, AC006160, AC002307, AC007685, AC005695, AL034554, U85195, AL034350, AL049843, AC005300, AC004659, AC004883, AF045555, AC002470, AL035659, AC003692, AF053356, AL031118, AC005696, AC007051, AD000092, AL121825, AC002347, AC008101, AC005632, AC005288, AR036572, U91328, AC003098, AC004522, AC007666, AF134726, AJ003147, AC005924, Z98742, AL096701, AC010202, AC007226, AC007358, AL008630, AC006512, AC004982, AC004972, AC007363, AL031257, AC000066, AL031281, AC004814, AC022517, AF064861, AL021707, AL022302, AC006130, AC004893, AC005988, AC004811, AC009721, AL049699, AP000501, AL121655, AL121653, U62317, AC016831, AL031687, AC005701, AC005740, AC006538, AL121652, AC006120, AC007245, AL117258, AC006088, AC005829, AF190465, AL022238, AC005104, Z99716, AC003025, AL035695, AC002395, AC004865, and Z83844. |  |  |  |  |  |
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| HWLFP46 | 572 | 882848 | 1 - 610 | 15 - 624 | AA167712, AA484145, AI042311, AI251597, AI816141, AA582528, AJ382825, AI732151, AI355426, AA832175, AL041146, AA663600, AI469968, T94249, AC005483, U07563, Z98036, AL031432, AC005089, Z99754, AC006335, AL031678, AC004534, Z98884, U95743, AL022336, AL050313, AC004045, AC003080, AC005037, U16300, AC002301, AC004808, AL022725, AC004890, U52112, AC011311, AL035664, AL023582, AC002425, AC005280, U62317, AC005599, I05724, AR002329, I08174, AI9048, AC005777, Z83820, AL109758, AC008150, AL096799, AB020858, AC004584, AL031848, M16553, AB007955, AL049553, J02846, AP000310, AB000877, AC004631, Z68870, AC005331, AC004559, AC004237, Z82248, AC005776, AC000087, AC004144, AC006046, AC005775, AP000148, AL096774, AC005031, AC006130, AP000233, AC002369, AC004874, AP000116, AC008116, AC004813, AC004997, Z95116, AC002996, AC007243, AL022313, AC005155, AC005839, AC004999, U80017, AC006364, AF064861, AC002526, AC002563, AC007666, AL009181, AC007388, AC009275, AC006502, AC005585, AC004852, AC007462, AL021368, AC000052, AC008039, AC003101, AC003684, AC007308, and U66059. |
|---------|-----|--------|---------|----------|---|
| HWLFQ48 | 573 | 721154 | 1 - 243 | 15 - 257 |   |
| HWLFS01 | 574 | 915531 | 1 - 453 | 15 - 467 |   |
| HWLFS86 | 575 | 830246 | 1 - 578 | 15 - 592 |   |
| HWLFV61 | 576 | 922924 | 1 - 135 | 15 - 149 |   |
| HWLFW01 | 577 | 915527 | 1 - 516 | 15 - 530 |   |
| HWLGL36 | 578 | 806724 | 1 - 419 | 15 - 433 |   |
| HWLGP10 | 579 | 833139 | 1 - 306 | 15 - 320 |   |
| HWLGP21 | 580 | 958259 | 1 - 129 | 15 - 143 |   |
| HWLGR72 | 581 | 958284 | 1 - 629 | 15 - 643 |   |
| HWLGT12 | 582 | 966044 | 1 - 358 | 15 - 372 | AF047825.   |
| HWLGT54 | 583 | 952732 | 1 - 691 | 15 - 705 |   |
| HWLGV83 | 584 | 871680 | 1 - 600 | 15 - 614 | AA224977.   |
| HWLGX56 | 585 | 830329 | 1 - 570 | 15 - 584 |   |



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|---------|-----|--------|---------|----------|--|
| HWLHC73 | 586 | 830319 | 1 - 551 | 15 - 565 | AI799075.<br>AW089625, AA577824, AA188940, AI354847, AI679002, AI732911, AA309533, Z23155, AA192366, AI243789, AA829044, F33184, AW084152, W96277, AA825954, AW265688, AI243793, AI287921, AA856815, AA551067, AA640277, AA618453, AA642787, AA371410, D51877, AA764812, AA831913, AI114494, F16409, AI862716, AA385775, AI028498, AI791390, AA569053, AI185394, AA742815, AA226532, AA599080, R67701, AA678472, AI885465, AA654482, AA297969, AW304699, AW419389, AL119331, AI929796, AA601673, AI174531, AA610255, AA878407, AW243945, T49184, AA572987, AA728861, AA558366, AA582746, F26072, N40092, AA493829, AW069227, AL120543, AI345497, AI247973, AW068786, AA578535, AW338506, AI039257, AA513916, AA320105, AI689198, AL008718, AC005071, AP000503, AC004253, AL034417, AC005015, AF134726, AP000031, AC004765, AL133448, AC004019, AL022316, AL049697, AC002432, AL031682, AC005488, AL031056, AL024498, AC016831, AC002565, AC005529, AC004185, AC005081, AF001549, AL022318, AC002425, AP000556, Z98946, AC006146, AC005274, Z99128, AC002381, AC002094, AL133245, AL121748, AC005696, AL133163, AC011331, AL034420, AC005225, AC002312, U91323, Z83845, AC006312, Z83844, AC004531, AC005736, AL049832, AC007308, AC005527, AF196779, AC002550, AC004996, AC006449, AC006356, AL133382, AP000553, Z84487, AC004812, AP000032, AP000509, AC007731, AC005730, AC005264, AC005500, AC006130, AL031390, AC004167, AP000346, AC007055, U78027, AC005011, AL031311, AC004854, AC007057, U91318, AJ246003, AP000557, AC005754, U95742, Z84469, AC005678, Z82198, AC003982, AC005180, AF053356, AC005776, AC004832, AL109798, AP000135, AL050318, AC005486, AC002553, |
| HWLHF49 | 587 | 926878 | 1 - 538 | 15 - 552 |  |
| HWLHO01 | 588 | 915158 | 1 - 514 | 15 - 528 |  |
| HWLHP05 | 589 | 931087 | 1 - 404 | 15 - 418 |  |

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|---------|-----|--------|---------|----------|---|
|         |     |        |         |          | Z68192, AP000555, AC005568, Z98750, AL035422, AC009946, Z98052, AC004033, AC005003, AL031663, AP000511, D84394, AP000103, AC004067, AC006318, Z82244, AC007216, AC002350, AF001550, AC007052, AC004491, AP000075, AL121658, AL031846, AC004814, AL080243, AC005023, AC004143, AL020997, AL049780, AC005803, AC007899, Z84466, AL132994, AL049779, X66401, AF111168, AC005940, AC005971, AL080242, AC004975, AC005412, AL034548, AC007387, AC006512, AL021154, AC007360, Z98051, AP000252, AC004134, AL109984, AC009464, AC006160, AC005004, AJ251973, AC002310, AC007919, AL033518, AC003688, AC005200, AC006441, AC006960, AL031984, AC006254, AL022152, AF038458, AC004707, Z99127, AL121923, Z97055, AC006080, AC003663, AC004834, X87344, AC005808, AC007541, AC003109, AC006317, AL022324, AL133312, AL109627, AC005288, Z93023, AC006966, AC007686, AP000212, AC005231, AP000493, AC007041, AC004209, AF196969, AC005291, AC008171, AL023775, AC012627, AL009181, AC002491, AP000114, AC005531, AC005245, AC004805, AF064861, AC007312, AC007012, U95740, Z74739, AF091512, AL023876, AL021155, AF121781, AL133353, AF048729, AC006285, L78810, AC004890, AC002091, AF001552, AC005209, AC004458, AC002996, AC002991, AL031678, AC005664, U52112, AP000313, AC008372, AC006465, AC006509, AL022311, Z95116, AF047825, AC007637, AC006453, AC005306, AC007551, AC005519, AL049745, AL031281, AC005355, AL132777, AC005785, AL117328, AC005694, AF019413, Z98884, AC006251, AL050321, AP000347, AL135959, AC005305, AL022165, AC020663, AC007386, AC006236, AL096774, Z98742, and Z73359. |
| HWLHR93 | 590 | 952387 | 1 - 367 | 15 - 381 |   |
| HWLHT06 | 591 | 934217 | 1 - 362 | 15 - 376 | AA507824, AA493708, AW406755, T40452, AA703891, AI365988, AW193265, AI284640, F29989, AI554201, AI431303, AA580808, AI350211, AI613280, AA467820, AW438643,   |

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| AL043719, AI583283, AL038705, AI270117, AA577906, AA468244, AI610159, AA602047, AI619997, AI751216, AW270270, AI559251, AI345654, AW072587, AI281881, AA523242, AW148792, AW274346, AI792287, AL037683, AW273218, AI969436, AI962050, AA229814, AA483771, AA491284, AW276827, AI539563, AI334443, AA720702, R35746, AA584167, AI801482, AI754955, AI472222, AA446544, AI537506, AW021583, AI085719, AW303196, AW274349, AA621858, AA649781, AW302450, AL119691, AA653618, AI589461, AI375542, AI282511, AA555141, AI254615, AA552856, AI863054, AI917271, AI439210, AA552843, AA908468, AL041690, AW301350, AI732120, AA533725, AA857486, AI286356, AI625647, AL048925, AA507547, AI702314, AI355206, AI053672, AI634384, AW440545, AI357288, AL046898, AW149339, AI338350, AA847952, AA579366, AA493621, NS3150, AI733755, AI963720, AW238278, AA629992, AI192631, AA856954, AA630925, AA177061, AA551503, AA581903, AA722372, AA490183, AW276435, AW087356, AI696962, AW238542, AW028429, AA653375, AA631507, AI149478, AI251436, AW406447, AI307608, AW008952, AW071196, AA856848, AW408047, AW085780, AA225944, F28204, AA639248, AA513141, AW194250, AI583612, AW088846, AA468022, AW079135, AI568678, AA548058, AI744826, AF034184, AW341900, AA521323, AA092078, AA492166, AA584082, AA610491, AA502104, AA747105, AA586458, AA665330, AW080125, AL046205, AA559290, AI281903, AI954260, AI744995, AA533036, H95681, AA623002, AA521399, AA747276, AI250019, AI860013, AA661948, AA581463, AA470969, AI355224, AA610271, AW327868, AA503473, AI633025, AI624097, AW238583, AA502155, AA482681, AA526758, AA484696, AW419262, X75335, X55930, D83989, M37551, Z79422, U57005, U67827, X54181, X55923, X54178, U18391, U18392, U57006, U18395, U18394, X55925, X54179, U18390, U67829, X55932, X55926, U57009, X55927, U57008, I51997, |  |  |  |  |  |
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| AF077058, L47228, X55929, X55933, U18399, U18398, X53550, X54175, U67831, AC004890, AC007676, AC005954, AF015153, U57007, AC005777, U18400, AL117337, X55922, U67825, U18388, M87919, U18387, U67801, U18396, U18389, U67826, U14705, AP000555, AC005726, X54177, AP001037, AC005089, U14701, AC005940, AL021155, Z78627, AL021546, AF176915, AC005378, AF015157, AL109802, AL110505, AC005261, AP000113, AF015156, AF217403, AC005212, AP000556, AC004990, AC005664, AC007051, X74558, AF128525, AF107885, AC007308, AC004686, AC007243, L48038, AP000513, AF015147, AL133246, AL031577, AC005520, AL031257, AF015149, AB023049, AC006312, AL078476, Z83840, AC005231, AC016026, AL034549, AL031281, AC004491, AC007845, AC005538, U91326, AC006116, U57004, AC007421, AL033521, AC003041, AF070718, AF015151, U67235, AC009946, AC009516, AP000432, AC006600, AC004771, U07000, M87925, AC008012, AF205588, AL035681, AL021937, AC005544, AC002430, X78901, AC005015, Z49235, AB000878, AC015853, U11309, AC005844, AC000026, AC004894, AC007384, AP000469, AC007055, AC005944, Z84480, AC002082, AL117354, AC005105, Z97053, AF015150, AL035659, U91322, AL049795, M15205, AC002119, U67231, AC003982, AC007664, Z75744, U62317, U67230, AC005519, AC002059, AL035455, AC004613, AC003104, AL033523, AL109759, AC004895, AC002301, AP000552, AF015148, AC007324, AL022332, AC002054, AC007919, AC007546, AC006023, AC004841, AC009225, AC002559, AC002368, AC010206, AL031368, U67226, AP000567, AC006120, AC004972, U22376, AC005288, AC004600, AL031311, AL050097, AL031672, AC005081, AL049745, AC008498, U67229, AP000553, AL021939, AJ131818, AC005779, AL035071, U67213, Z49237, AC004028, U67234, AL031657, AL022721, AC002470, AC005011, AF015162, AC007371, AL035458, AL096829, AC004595, AL022315, AC007707, AC004531, AL050312, AC005500, AC005757, AC006207, |  |  |  |  |  |
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| HWLHT92 | 592 | 830322 | I - 446 | 15 - 460 | Z85996.   |
| HWLIC75 | 593 | 830321 | I - 45  | 15 - 59  |   |
| HWLIF03 | 594 | 830233 | I - 328 | 15 - 342 |   |
| HWLIH21 | 595 | 917551 | I - 803 | 15 - 817 | AI833131, and AI581835.   |
| HWLIL65 | 596 | 747440 | I - 512 | 15 - 526 | AA521246, AA834532, AA664369, AI827922, AA766094, AI458257, AI915368, AI914009, AA740983, AI128279, AI128274, AI160827, AI222682, N30618, AI872758, AI569363, AW020599, AA524229, AA635389, AA847949, AL033527, AC003663, AL109847, AC004551, AC002394, AC007371, AL109963, Z97989, AC002067, AC007057, AL022238, AL024498, AC005412, AC007639, AF196969, AL049760, AC005952, AC002565, AL049776, AC005520, AC005844, AC005553, Z84487, AC002563, AJ011930, AP000493, AC002036, Z93930, U82757, AL050307, AF199339, AC004382, Y13537, Z85994, AC006241, AP000100, AC004805, AL031281, AL031591, AL031276, AF047825, AC006515, AC002554, AC007637, AL049569, AC005781, AC003104, AL031681, AC005722, AC004504, Z98742, AC006141, AL035417, AC005886, AC006512, AC004491, AC004216, AL022721, AL049692, AL031767, AC006057, AC005486, AC007051, AC005081, AC007766, AL109984, AC003098, AC006077, AL035411, AC005940, AC005736, AC007225, AC008967, AL049872, AC005225, AL049794, AP000103, AP000032, AL031283, AP000263, AC004033, AL031295, AC011422, AC006001, AL031120, AC007226, AC002470, AC002990, AL031311, AC004167, AC002350, AP000036, AC005088, Z98750, U47924, AC004655, AC002070, AC005529, U07562, AC006117, Z98044, AC005324, AC004851, AL021154, AL121603, AC002126, AC004016, AP000512, and Z97053. |
| HWLIM37 | 597 | 712654 | I - 190 | 15 - 204 | AW291552, AW138601, AI077575, AA780149, AI470521, AI079239, AI350461, AI190936, AA700035, AA700691,   |

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|         |     |        |         |          |  | AA846411, AI075806, AA745860, AW104705, AI653668, AA620868, AA931634, AI358441, AI022949, AI147873, H78701, AA411234, AA599147, AA705723, AA912904, AI808843, AI400574, H41413, AA526292, AI682941, AA807011, AI027243, W47156, T73150, AA885483, AI300065, AI807760, AI457358, AI866405, AI986123, AF100749, and AR060022.   |
| HWLIO73 | 598 | 761965 | 1 - 309 | 15 - 323 |  | AI474787, AW132088, H26632, AI697470, AI748801, AI985035, AI613073, AA552037, AA486673, AW302255, AW273755, AI654071, AI833092, AA485303, AW001735, AI633999, AA555209, AI889437, AI678144, R54622, AI720421, AA630239, AI709263, AI624856, AI925932, AI720864, AI749272, AI493247, H44026, AA347725, H14641, AI459687, AW270873, AI700126, AW271969, AI433393, AI963703, AA552441, H70926, AW377424, AA838075, AW299847, AW377450, AI678860, AI539136, AW361066, AI470617, AI284215, AW339456, AA553745, AI700750, D25586, AA553746, AI720744, AI916628, AI279141, AI690207, AI735160, AI581560, AI631055, T96160, AI283780, AI707504, AI273946, AI749659, AI832808, AI721199, AW363628, T94910, AI445357, T39321, AI611197, AA953731, AI873587, AI275765, AI275202, AI480124, H24673, AA485460, AI749891, T94865, AA553861, AI687436, AW242695, T24762, AW375718, and AI263070. |
| HWLIS62 | 600 | 722358 | 1 - 499 | 15 - 513 |  | AI335089, AW071975, AI922669, AI343825, AA875852, AI554367, AI290781, AI357884, AI088635, AA972857, AI129815, AI168499, R62969, AA813538, AA702864, H05057, AA436814, R39812, N78991, AA442570, W74268, AA133776, R56602, T48889, AA627735, AA142932, R80928, Z39624, R59136, R66723, AA993978, R67603, F02373, AA228698, R66262, AA368546, AA115592, AA486747, W17367, W79882, AL034397, and AJ132502.   |
| HWLIW68 | 601 | 925892 | 1 - 472 | 15 - 486 |  |   |
| HWLJB04 | 602 | 926066 | 1 - 446 | 15 - 460 |  | AA862391, and N62231.   |
| HWLJC30 | 603 | 830232 | 1 - 726 | 15 - 740 |  | AI767585, AA516447, AW272896, AW299599, AA974871, AA524410, AI963626, AW204624, AI698859, and R67729.   |

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| HWLJE89 | 604 | 928258 | 1 - 572 | 15 - 586 | AW270505.   |
| HWLJG57 | 605 | 849123 | 1 - 518 | 15 - 532 |   |
| HWLJL14 | 606 | 832205 | 1 - 338 | 15 - 352 |   |
| HWLJL46 | 607 | 830226 | 1 - 342 | 15 - 356 |   |
|         |     |        |         |          | AA506744, AA219542, AA776548, AA084679, AW248724, W47141, AW249151, AA679173, AA101377, AA668421, AA300049, AI445699, AA147521, AI702049, AI002952, AW265468, AW148821, N78600, AL138262, AW192930, AA757406, AL121039, AA621720, AW410844, AA180857, AI064968, AA172103, AA846014, AW020198, AW247338, AA077619, AA593480, AA182629, AI679759, AA516247, AA778962, AI133083, AI819391, AI283938, AW008184, N53448, AI267356, H94598, AA484651, AI241637, AW243808, AP000353, AL008720, Z92546, AC004150, AC004825, AL121655, AL035451, AL050307, AL133353, Z83308, AC005207, AC007514, Z82249, AL137548, AC004999, AC005031, U80017, AC020663, AC006023, AC006539, AL020997, AC005412, U71148, AL050341, AC006449, Z99755, AC002984, AL023575, AC003086, U62317, AL022313, AL078638, AC006241, AF207550, AC002430, AC002558, AL031295, AL022721, Z97055, AC002418, AC007384, AC004821, Z83820, AC006333, AF124730, AC004234, AC005484, AL021939, AC004386, AL022238, AC006130, AC005231, AL031282, AC002544, AL031668, AL109952, AL078581, AC005519, AC005696, Z98742, AL050129, AC006441, AC005694, AL031680, AL096801, Y18000, AF196779, AC004972, AC004019, AL049758, AP000300, AC003002, AP000045, AP000113, AL035417, Z98941, AC005043, AL031584, AC005874, AF134471, AC007731, AC004765, Z83847, AC005500, AL049776, Z93023, L47234, AL031728, AL135784, AC005377, AL096701, AC007684, Z95114, AC006581, AC003004, AD001527, AL031186, AC004505, AC005911, AC005399, AC009516, AC008009, AC005261, U95742, AC007565, AP000349, AP000230, AP000144, AC002425, AL109967, AC006254, AL022162, and AC007387. |

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| HWLJN54 | 608 | 729051 | 1 - 603 | 15 - 617 | T91244, T81477, T80967, AW269968, AI110776, Z95437, U69569, AC004536, AC004855, AB019437, AC009233, AC006986, AC007274, AC006991, and AL031119.   |
| HWLJN66 | 609 | 830229 | 1 - 541 | 15 - 555 | Z97053, AL031005, and AL022326.   |
| HWLJP79 | 610 | 963698 | 1 - 836 | 15 - 850 | AL044649, AW149822, AW372403, AW022126, AI937028, AI832398, H52755, AI902686, AI523476, AI125713, D61865, AA913606, H23922, AI671047, AI523319, AW338626, AW338631, C05054, AW069280, AW025428, AI017617, AI554450, H65437, R83782, AW020014, AW384060, N20088, AI025375, AA358941, AW020227, AW372379, AW193889, AI921185, AI097582, C16388, C16369, AW021585, AI269495, AW118958, C16167, AI018455, AW384059, D54010, AI268738, AA380556, AI219878, H99109, AI278598, AI300002, AA503421, AI796695, AI421622, AW118123, AA708591, H88061, AI242119, H48158, AI925067, AA631826, AW080615, R71561, AI033678, AI423988, AI424104, AI222739, AA213469, H02742, N20549, AA744800, AA434408, D61931, AA179347, AA555272, D61016, AA564521, H04059, H45223, D81374, AI744022, AW151012, AA729594, AA987628, D60574, AI762567, H49945, H02770, H02165, AW242024, AA179154, AI690550, AW262043, AA551955, AA507614, D54275, AA214237, T35691, AA725244, D60843, C15668, AW362248, H02769, T30072, AA419350, AW376397, R80139, T05116, D60575, D60695, D60842, AL048702, H02164, AA527710, AW085223, AW021333, N29664, AA679787, R15695, AA744656, AA622316, AW407259, T18586, AI709204, D58121, T31072, H42460, H89037, C16578, C15955, D55586, AA482734, AW169465, H52797, H88062, AA715156, H88954, AA040056, AW006042, R10801, R63592, AW384124, R21798, AA330605, D52526, AW366348, AW078841, R71506, R10709, R34609, AA405202, AA151219, AI671907, AA040042, AA151218, AW269344, F13646, AI000596, AA861747, H03111, AI869576, AW362494, AA225398, T90939, AI302914, R34216, AA298995, AI355633, AA516073, AA089751, AA405203, R26368, R63540, AL079897, AI748860, AA910712, AA876685, AI648500, AA091600, |



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| HWLJR77 | 611 | 883207 | 1 - 647 | 15 - 661 | AI902685, AW366389, AA383198, and T18524.<br>AI732905, AI833168, AI991154, AW001333, AA828206,<br>AA296957, AW001526, AI749030, AI880265, AI984533,<br>AI984522, AA937899, AW000842, AW001511, AI708091,<br>AA297154, AI989764, AW050874, AA297177, AI673643,<br>AI673652, AA297205, AC002301, and I95747.  |
| HWLJX38 | 612 | 925868 | 1 - 148 | 15 - 162 |   |
| HWLJZ30 | 613 | 925870 | 1 - 596 | 15 - 610 |   |
| HWLKC87 | 614 | 956205 | 1 - 517 | 15 - 531 | AF179880.   |
| HWLKF70 | 615 | 830237 | 1 - 724 | 15 - 738 | AW183080, AI809545, AI693513, AW083841, AI762076,<br>AW362479, AW291420, AW296936, AA657953, AA229394,<br>H91857, AW105152, H91911, AA766735, AF003827, and<br>AA877622.  |
| HWLKL17 | 616 | 928720 | 1 - 422 | 15 - 436 |   |
| HWLKR35 | 617 | 918557 | 1 - 597 | 15 - 611 | AL134524, AL045328, AL038838, AL037436, AL038983,<br>AL047163, AI142134, AL079852, AL047012, AL044125,<br>AL044162, AL040193, AL037295, AL037727, AL038532,<br>AL040621, AL043538, AL043496, AL040464, AL041347,<br>AL037323, AL041324, AL038822, AL041098, AL037435,<br>AL040075, AL040463, AL041238, AL038761, AL037343,<br>AL041163, AL044186, AL047170, AL040617, AL040149,<br>AL043923, AL043814, AL037335, AL047219, AL044037,<br>AL043845, AL040625, AL041635, AL041296, AL045684,<br>AL040294, AL040576, AL041752, AL044064, AL040510,<br>AL041459, AL047183, AL043467, AL041577, AL045753,<br>AL042898, AL041086, AL041246, AL041096, AL043677,<br>AL040839, AL043492, AL041602, AL040444, AL040052,<br>AL046850, AL037443, AL040768, AL044074, AL041730,<br>AL041523, AL043627, AL046994, AL041374, AL040472,<br>AL041133, AL046914, AL043848, AL043570, AL046442,<br>AL042135, AL040322, AL041233, AL041358, AL040119,<br>AL039360, AL045671, AL039316, AL046392, AL041955,<br>AL044272, AL041159, AL041168, AL047057, AL045817,<br>AL044258, AL041346, AL045920, AL134110, AL040148,<br>AL038745, AL041292, AL049018, AL040458, AL044187, |

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| AL041142, AL040332, AL045990, AL041197, AL044199, AL040529, AL040571, AL039643, AL046330, AL041277, AL079878, AL039338, AL040745, AL040370, AL040128, AL047036, AL044274, AL040553, AL040342, AL041186, AL040155, AL040414, AL040285, AL039744, AL040091, AL039432, AL044165, AL042096, AL041131, AL037341, AL043941, AL040090, AL045989, AL041051, AL040168, AL044201, AL046327, AI547295, AL043775, AL043444, AL045327, AL040253, AL041227, AL045857, AL040082, AL040329, AL037279, AL047037, AL041278, AL040238, AL040263, AL041140, AL044529, AL040255, AL045725, AL039915, AL043612, AI526176, AL041344, AL038651, AI547039, D29033, AL049069, AA585439, AL048677, T11028, AL041210, R29445, AL038878, AA585101, AL045211, Z28355, T23957, T23985, C16300, AL043537, AI318479, Z30131, AI547291, D61254, AI525556, AI541383, D57491, AI557084, AI526073, AI547250, AI546875, AI541374, AI541523, AI525431, AI546999, AA174170, AI541205, R29218, AI540967, AL079977, AI546945, AI541508, C16305, D55233, C14723, AI541365, AA585098, AI557731, AA585453, AI557262, AI541514, AI546971, U46344, T41289, D60844, AI546891, AA585476, AI525500, AI526194, AA283326, R28735, AI546828, AI557864, R28895, AI541346, R29177, AL038024, R28965, AI541017, AI547006, AI525306, AB033107, AR064707, AJ238010, AR066494, U94592, I05558, A93923, D50010, D17247, E13740, AJ244003, AJ244004, AJ244005, E03627, I48927, Y16359, AB025273, I84553, I84554, A60212, A60209, A60210, A60211, A98767, AR031566, A90655, A93963, A93964, AR062872, I63120, AR062871, AR017907, D13316, AR062873, A35536, A35537, AF082186, A25909, I06859, A18050, A23334, A75888, I70384, A02135, A04663, A02136, A04664, A60111, A23633, A02712, AR007512, AR038855, A81878, A77094, A77095, I00682, A95051, A18053, A93916, A20702, D78345, A64973, A43189, A43188, A20700, A11623, E00609, A11624, A98420, A98423, A98432, A98436, A98417, A98427, A11178, |  |  |  |  |  |
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|         |     |        |         |          |  | E01007, I13349, A10361, AR043601, A11245, Z32836, A93931, D13509, A22739, A85203, X81969, A16035, E17098, A133053, A122101, AR054723, AR023813, A133074, A133049, and A22734.   |
| HWLKV34 | 618 | 957615 | 1 - 646 | 15 - 660 |  |   |
| HWLKV91 | 619 | 830214 | 1 - 513 | 15 - 527 |  | N54321.   |
| HWLKW0  | 620 | 969141 | 1 - 597 | 15 - 611 |  | AA046825, AA156232, W24222, AA046808, AI074059, AA804565, AA156054, AI079406, AI335087, AI831194, AA927505, AI038824, W20117, AI141175, AA147488, AI085738, AI081430, AI141435, AI086672, AI308846, AI088093, AW263203, AI391491, AA996038, AI146608, AI086624, AI085956, AI095699, AI147805, AI312528, AA888166, AA888822, AI075648, AI041513, AI074781, AI571404, AA927030, AA788786, AI309731, AA863122, AI025254, AA844067, AI073644, AI000826, AI079595, AA960909, W46844, AA576992, AA225982, AA676445, N23131, AA037037, N95533, AA974466, AI741287, W47172, AA975580, AI023076, AI028417, AA862562, N20551, AI203524, F20461, AA854218, AI719742, AI031831, N29263, AI303024, AA137068, AA225981, AI880811, AA071499, AA137139, AA557947, AA470526, N49765, AI017241, AA071339, AI913857, AA082294, H40198, W46671, W61183, AA552473, AI085091, AI192144, H89983, W61182, AA485185, W68371, R78487, AA654079, AA157472, AA302416, AA082321, H81768, AI261461, N90436, AA746698, W37801, AA657730, D11865, AI371356, AI335366, AI345778, AA506060, AW305338, AI345129, AW268293, AI345740, AW303172, AI349836, AI349012, AI289672, AW086304, AI318134, AI310633, AI344902, AI345676, AW302638, AI310894, AW074966, AW301359, AI318161, AI318149, AI335466, AI343156, AI254293, AI345323, AW274108, AI583762, AI613395, AI345208, AI318603, AI318602, AW274347, AI613385, AI224645, AI310790, AW302802, AI252728, AI583885, AI591254, AI336702, AI345422, AI307887, AI817421, AI306231, AI337623, AI343069, AI249590, AI609969, |



|             |     |        |         |          |   |
|-------------|-----|--------|---------|----------|---|
|             |     |        |         |          | AF017152, AL050116, AI2297, AF026816, Y10655, AC002467, AL137526, AF090943, AF118064, E05822, M30514, AF153205, A93350, AL096744, AL117440, AF061981, AL122093, AF091084, I26207, AL133080, AL133098, X87582, AL080127, E08631, AL133077, AL133568, AL137300, AL050393, AL133010, AL117432, AL050277, AF111112, I41145, A18788, AL080086, AF003737, AF113689, AL049466, AL133093, AL049283, AJ000937, AL133081, AL133665, X92070, AL137529, U00763, AF125949, AF113676, S78214, U80742, I00734, X63574, U72620, E07361, AL122110, AF100781, AF017437, I09360, AL049452, AR000496, U39656, AL117585, AL117457, Y14314, E00617, E00717, E00778, Y07905, AL080074, AF081195, AL122123, U49908, AL080060, AF210052, AF097996, AL133558, AF051325, A90832, Z37987, AL137294, AJ006417, AB019565, A21103, AF078844, S75997, E06743, AI250217, and AI334740. |
| HWLKW0<br>9 | 621 | 951716 | 1 - 571 | 15 - 585 | AP000500.   |
| HWLKW1<br>7 | 622 | 860227 | 1 - 218 | 15 - 232 | AA503041, AW013974, AW021078, AI817999, AA856857, AI188696, AI499321, AI815007, AI375786, AI457260, AI472695, AI523679, AA916048, AA909513, AW169263, D53008, AI818022, AA629711, AI041426, AI334313, AI800128, T34424, Z17371, AW090077, AW088569, AI500715, AI149944, AW117620, T68169, AI872743, AI761089, AI671757, HI2634, R79928, D57350, AI469660, N73071, T07670, AA648091, T63380, AA666212, AI819847, D57802, and D56837.   |
| HWLLB11     | 623 | 954849 | 1 - 731 | 15 - 745 | AI745636, and AA102414.   |
| HWLLH02     | 624 | 918427 | 1 - 322 | 15 - 336 |   |
| HWLLH25     | 625 | 933479 | 1 - 122 | 15 - 136 |   |
| HWLLS11     | 626 | 965899 | 1 - 731 | 15 - 745 | AA521136, AI002240, AL134536, AW392670, AL119355, AL119341, AL119457, U46346, AW372827, AW363220, AW384394, AL119443, AL134920, AL119319, AL119497, AL119335, AL134902, U46351, AL119324, U46350, Z99396, U46347, U46349, AL042433, AL119484, AL119363, AL119391, AL119444, U46341, AL119483, AL037205, U46345, AI142131,   |

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|---------|-----|--------|---------|----------|--|---|
|         |     |        |         |          |  | AL119439, AL119399, AL119401, AL119522, AL119396, AL119496, AL042984, AL134529, AL119418, AL042450, AL042614, AL134525, AL134538, AL042975, AL042965, AL042551, AL042544, AL043019, AL042970, AL042542, AL043029, AL043003, AL119464, AR054110, AR066494, A81671, AR060234, AB026436, and AR069079.   |
| HWLLT02 | 627 | 918419 | 1 - 521 | 15 - 535 |  | AL031652.   |
| HWLLV41 | 628 | 830150 | 1 - 405 | 15 - 419 |  | AI589207, AC002472, and AC002470.   |
| HWLLX12 | 629 | 969681 | 1 - 399 | 15 - 413 |  | AC002379.   |
| HWLMA84 | 630 | 929421 | 1 - 202 | 15 - 216 |  | AA418995, AL121270, AI370623, AL040844, AI862139, AI927233, AW189802, AI522256, AI590043, AI539260, AI540354, AI909661, AL042722, AI307513, AA715307, AA809974, AI633317, AL039716, AI270183, AI582932, AA748353, AI797578, AI434255, AI064830, AI698462, AA761557, AL119863, AI445611, AI758560, AI568293, AI932620, AI683555, AI799313, AI690969, AI417790, AI688241, AI571442, AI282669, AI537273, AI364167, AI468970, AI624543, AI435253, AI638644, AI095003, AA731184, AI909672, AW085181, AI610714, AI919600, H44725, AI698391, AI673395, AI635082, AI439452, AI050084, AI673363, AA814343, AI800341, AA676361, AI866484, AI079226, AI470717, AI679266, AW044367, AI500714, AI610411, AL046466, AI872423, AI524179, AW087540, AW087445, AI918809, AI866469, AI799183, AW081176, AI299035, AI273179, AW128834, AI521560, AW188525, AI915291, AW152182, AI536601, AW262552, AW051088, AF067844, Z13966, I89947, M85164, AR050959, E12888, A65340, AF090903, D83032, D44497, AL110223, AJ003198, AR038854, AF087943, AF000167, U37359, AL122049, AL110158, AL137716, A23327, Y14314, AF129131, AL133051, AI2558, A38574, AL117587, AF141289, AF124728, and AL117416. |
| HWLNX76 | 631 | 887583 | 1 - 522 | 15 - 536 |  | AA064845, AF126484, AF113925, AF149774, and AC006027.   |
| HWLPC29 | 632 | 965058 | 1 - 603 | 15 - 617 |  | AA525279, U51700, AI904835, and AL049713.   |
| HWLPG05 | 633 | 930991 | 1 - 330 | 15 - 344 |  | D60875, D60267, and D60874.   |

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|----------|-----|--------|---------|----------|---|
| HWLRA85  | 634 | 965400 | 1 - 594 | 15 - 608 | AI493856, AA779066, AI343583, AI668803, AI346964, AI768858, AI984669, AW271303, AI962453, AW044292, AI800575, AI191409, AI692246, AA633357, AA811380, AI142462, AA761737, AA609336, AA568833, AI935515, AW299302, AA599678, AI698071, AI703351, AI445511, AA502281, AA765235, AA663918, AI356972, H00731, AI040729, AW044281, AI817239, AI040041, AI148133, AA760754, AA806273, AI084370, AI088469, AA209476, AA043699, AI167227, AA043649, AI184658, AA255603, AA576467, AA614019, AA285129, AA255580, AA781637, AI984665, AA025353, AA781325, AI949269, AI375319, AI630213, D20127, AA044787, AI918926, AA548537, D58189, AA039984, R59874, AA085467, AI537816, H88293, AW271326, AI862141, AI500111, AI193531, W32202, AA772611, AA187326, AI391515, AA354181, AI355757, AA828122, AA854495, R76720, AA740937, AA449425, H49479, AA417831, R79273, Z40227, AA040631, AA450390, AI754002, W32257, AF053318, and ALI22045. |
| HWLUB86  | 635 | 966462 | 1 - 155 | 15 - 169 | AC008116.   |
| HWLVF04  | 636 | 926880 | 1 - 704 | 15 - 718 |   |
| HWLVO06  | 637 | 933592 | 1 - 414 | 15 - 428 | AI628277, AI700170, AI434481, and AC004460.   |
| HWLVSS2  | 638 | 925738 | 1 - 493 | 15 - 507 |   |
| HWLXE16  | 639 | 975258 | 1 - 455 | 15 - 469 |   |
| HWLXO01  | 640 | 913808 | 1 - 501 | 15 - 515 |   |
| HWLZB12  | 641 | 969262 | 1 - 548 | 15 - 562 | AA917956, AI078015, AA625053, AI308830, AI348305, AI301350, AI343797, AW339860, AA837028, AI275863, AI025643, AI025649, and AJ236591.   |
| HWMMAD05 | 642 | 931076 | 1 - 396 | 15 - 410 | N86362, AA565006, F26713, AI434037, AA347382, AI064843, AA078184, AA745543, AI368732, AI133612, AA165505, AA515742, AW419389, AA630122, F24745, F23287, AA165346, AI686470, AI433104, AW243884, AA568314, AA595661, N44129, AA229422, AA214042, AI811647, AW105729, AA847102, AA460896, AA728880, AA303011, AC007462, AI132777, AC008009, AC006441, AF001550, AF217403, AI035072, AI022718, AC004884, AC006443, AC006323,   |

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|-----------|-----|--------|---------|---|
|           |     |        |         | AC006130, AC008044, AC006544, AC007773, AC004552,<br>MI7262, AC004983, AF000704, AC005874, AF134471,<br>AC016830, AC003026, AL031295, AC004263, AL109952,<br>AL031686, AL035459, AC005667, Z98743, AL022318,<br>AL022394, AC004584, AF196779, AC003037, U02068,<br>AC002350, U91326, AL135960, AJ131016, AC016027,<br>AL109657, AC006084, AC002492, AP000547, AC007055,<br>AL035249, AC002301, AC004820, AC008122, AC002550,<br>AC007376, AC005203, AL034344, AC004517, AC004834,<br>AF111170, AB026898, AL020989, AC007774, AC007688,<br>AL109758, AL023805, AC003982, AC004610, AF111169,<br>X55448, AL033376, AC004033, AC003663, AP000023,<br>AC005520, AL133244, AC003684, AC004453, AF031078,<br>AL031428, AC007371, AL078472, AC002404, AL023807,<br>AF030876, AC006166, AB023051, AC007421, AP001053,<br>AL022334, AC007367, AL031289, AC005049, AC007151,<br>Z83838, AC002300, AL035400, AC004967, AC007312,<br>AC004253, AC007999, AC005670, AB020874, AC004974,<br>AL049709, AC012384, AP001052, U63721, AF107045, Z98036,<br>AL020997, AL022726, AC006237, AC005305, AC004996,<br>Z84488, AL021397, AC005015, AC009247, AC005159,<br>AL024507, Z95116, Y14768, U91323, AL034379, AL031176,<br>AC004531, AC000025, AC007686, Z93023, AC004707,<br>AL009178, AL022476, Z29336, AJ003147, AC004382,<br>AF064861, AC002430, AC002558, AC005519, AC010200,<br>AC004493, AC005786, AC004217, AC005663, AC007731,<br>AC005221, AL022393, AF118808, AL031280, AC005620,<br>AL021407, AC005189, AP000220, AC004590, AC005392,<br>AC005971, AC005839, AC004690, AC005972, Z84469,<br>AL049856, AB026899, Z86064, AC005632, AC007384,<br>AP000116, AL049795, AL024498, M31666, AC005036,<br>AC004876, AL022313, L78746, AP000133, AP000211,<br>AL121769, AL021707, AC002365, AC005902, and AC002045.<br>AW148716, AI917055, N42321, AL038605, AI802542,<br>AW302965, AI815855, AI340603, AA427700, AI308032, |
| HWN/IE107 | 643 | 830227 | 1 - 302 | 15 - 316  |



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| AI569583, AI312428, AA225339, AI269862, AI962858, AI571909, AL048656, AI521012, AL079963, AA640779, AW103371, AW403717, AL045266, AL039086, AI497733, AW023590, AI890833, AI926790, AI687127, AI590120, AI064830, AA572758, AA508692, AI564719, AI889376, AW268220, AL119863, AI349645, AI619502, AI677796, AL121365, AW026882, AI815232, AI344785, AI783504, AI536638, AI524671, AI554245, AL042382, AL045500, AI433157, AI343059, AI702073, AI340627, AI349933, AI468872, AA287231, AW238730, AL119457, AI921248, AL047042, AI886753, AW087445, AW150578, AI620284, AL036403, AW132056, AL044207, AL036274, AI282326, AI922901, AL036396, AI340582, AL036146, AI349937, AI537677, AW071417, AW301409, AI308035, AI500523, AI281773, AW168795, AI500706, AL040243, AL121014, AI284131, AW068845, AW102785, AW103893, AI561299, AI269696, AL037454, AI648663, AI800453, AI800433, AI868831, AI888953, AW020693, AL120853, AI334884, AI633419, AI348897, AI498579, AI445165, AI866002, AI433976, AI828731, AI251830, AL036802, AW169653, AI648684, AI687065, AI612759, AL041772, AI610645, AI869367, AW148320, AI784252, AI340519, AI608936, AW075413, AI500077, AI919345, AW088903, AL036361, AI439717, AL041150, AI274508, AI366549, AI636719, AI539153, AI309401, AW022682, AW268067, AI539771, AL038779, AI567351, AW074993, AI431424, AI349614, AI866608, AI343112, AL038565, AL036980, AA613907, AI539808, AI862144, AW268253, AI567612, AW301300, AI349598, AL036664, AI349256, AW075207, AI433384, AI312152, AL079741, AI345735, AW274192, AI345551, AA974049, AA493647, AW075084, AI281772, AI950664, F27438, AW193134, AW105601, AW074869, AW089572, AI307543, AI307210, AI307708, AI500659, AI312325, AW088134, AI753683, AW079368, AI313320, AI612885, AA804740, AI307520, AI284517, AI923989, AW302992, |  |  |  |  |
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| AI754897, AI491776, AI445237, AW151138, AI828583, AI312146, AI312339, AI433037, AI345258, AW302988, AI684279, AI310575, AW411310, AI254731, AI538829, AI886124, AI340533, AW149227, AI812107, AI345347, AI282655, AW161579, AW301505, AI923768, AL036869, AA420722, F37439, AI680498, AW051258, AW086113, AI439745, AW303152, AI538716, AL036631, AI499285, AI432969, AI873644, AW269097, AI476109, AI349004, AI566670, AI250663, AI953562, AI491852, AW059837, AL036736, AI274728, AI632408, AW071349, AW302973, AW268060, AI267502, AL048871, AI559296, AI336495, AL038445, AI696612, AW081242, AL036214, AI681985, AW081797, AI689248, AI954183, AI570781, AL036945, I48979, I48978, Y11587, AL137459, A08916, E07108, AF113694, I89947, A08913, U00763, AJ000937, X63574, AF017437, I89931, AL133080, AL050116, AF097996, AF090903, A08910, A93016, AF113677, AL133016, AL133565, I49625, Y11254, AL117460, Y16645, AL110196, AF079765, AF104032, AL137557, S78214, AL117457, AF090896, X82434, AL049430, AL110221, AL050149, S68736, AF106862, AL049382, AL050108, AL080137, AF091084, AL133640, AL049314, AF111851, AL133075, AF090901, AL133606, AF113019, AF090934, X84990, AF090900, AL050146, AF177401, AR011880, AF090943, AF113013, AL133557, AL080124, U42766, AF078844, A08909, AF113676, AB019565, AL122050, AF017152, AF125949, AL133560, AL137527, AL122123, AL049466, AF113690, AL049452, AF113689, AF118064, AF113699, X70685, AL110225, AL117394, AL050393, AF118094, AL117583, AJ242859, AL117585, AF158248, A58524, I03321, A58523, AF113691, AF125948, AF146568, AL122093, AL133113, AL080060, AL122110, AF118070, L31396, AL096744, L31397, U91329, AL122121, U72620, E03348, AL133093, AL137550, A65341, AL049464, E02349, AR059958, X96540, AL049938, AF067728, E07361, AF183393, AJ238278, AF111112, AL050277, AL050024, A77033, A77035, |  |  |  |  |  |
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|          |     |        |         |          | AL050138, I33392, AF087943, AL137271, Z82022, AL117435, A03736, AL049300, AL137648, A12297, AL137463, AL137521, X72889, U80742, X65873, U35846, AF061943, AL137283, AL122098, Y09972, AL122049, M30514, AL110197, AF026124, I09360, AF026816, I26207, S61953, AL137538, AJ006417, AL049283, E15569, AL133014, X98834, AF119337, U67958, AL080159, AL137560, I42402, A93350, AL080127, X93495, AL133072, AJ012755, I00734, E00617, E00717, E00778, A08912, AL110280, AR000496, U39656, AL133077, E08263, E08264, AL137526, AF057300, AF057299, AL133568, AF100931, AF132676, AF061836, AL133098, AF079763, A07647, A90832, AL133104, AF003737, AL137556, Y14314, AL080074, Y07905, U68387, AL050172, X92070, AR038969, AR013797, E05822, Z72491, AF153205, I66342, AF185576, X87582, AF051325, AF081197, U78525, U58996, AR038854, X83508, E04233, AL137478, AL137523, I17767, AF111849, AF162270, AL133067, U96683, A45787, AL117440, AL137476, Z37987, AF008439, AL117649, AL137480, AL122118, E02221, AL137533, AL050092, U49908, AL137429, AF118090, L30117, E08631, AL117432, AF081195, AF061573, AL137294, AL080086, AF126247, AF106827, AF061795, AF151685, Y10655, X62580, AF000145, I09499, and AL137292. |
| HWME148  | 644 | 830256 | 1 - 252 | 15 - 266 | AC004777.   |
| HWME565  | 645 | 969190 | 1 - 582 | 15 - 596 | AC006237.   |
| HWMEU56  | 646 | 922375 | 1 - 487 | 15 - 501 |   |
| HWMEFA28 | 647 | 965354 | 1 - 437 | 15 - 451 |   |
| HWMEFG10 | 648 | 963406 | 1 - 578 | 15 - 592 |   |
| HWMEFG32 | 649 | 883180 | 1 - 360 | 15 - 374 | AA491767, H58891, AA515723, N69399, T40210, H73306, AA366601, AI590592, AI479148, AA486573, AW302923, AA846482, F34605, AI133083, AW089016, AI355873, AI620415, AL122020, AC004876, AC005585, AC005089, AL031311, Z93023, AL035697, AC007363, AC006020, AC002456, AL049830, AP000355, AC002312, AC004491, AC000379, AC007543, Z98742, AC005215, AC007637, AC007546, AF017104, AC002565, Z82205, AL034421, U80017,   |

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|---------|-----|--------|---------|----------|---|
|         |     |        |         |          | AL121652, AC006515, AB023051, AL031680, AC005081, AC004263, AC022517, AL034548, AL022476, AC006317, AL080243, AC005015, AC005225, AC004685, AC004217, AC007406, AC005696, Z98885, AC006312, AC002549, AC006578, AL031280, AC004019, AC003101, Z84469, AP000065, AL031295, Z98941, AL035658, AF134726, AL117352, AL035699, AC002369, AC007308, AC004381, AD000812, AC006211, AL020997, AF196971, AC005932, AC005529, AC004973, AL031577, AC005722, AL034409, AC004583, AF024534, AC004966, AC004216, AP000512, AL133243, AC004686, AC002430, AP000692, AC002365, AC004841, AC004638, AF196779, AC003108, AC007731, AC004887, AL022316, AC006101, AC005971, U62293, Z96074, AL049843, AC006238, AL031846, AL050341, AC007384, AL049569, AC005231, AJ003147, AC005846, AL139054, U96629, AL022721, AC005332, Z82211, AC004910, AC000052, AC005387, AL050318, AC005086, Z85987, AC002477, AC004707, AC002375, AC008044, AF053356, AC004797, AC006077, AC004584, AP000466, AC000067, Z82179, AC008268, AC004859, AC005632, AC005919, U91318, AF123462, AC006430, AF111169, AL049760, AC005057, AC007226, Z86090, AC006459, AF139813, AD000813, AP000509, AF111168, AC004905, Z69917, AC002558, Z84476, AC007193, AF001549, AP000248, AL022326, AP000350, AC002126, AC006449, AC004821, AL096703, Z95114, AL049856, AC002316, AL109798, AC004167, AC002310, AC009721, AC005082, AC005752, and AL034429. |
| HWMFH23 | 650 | 849129 | 1 - 332 | 15 - 346 |   |
| HWMFQ90 | 651 | 928646 | 1 - 347 | 15 - 361 |   |
| HWMFY21 | 652 | 974325 | 1 - 570 | 15 - 584 |   |
| HWMG13  | 653 | 947969 | 1 - 411 | 15 - 425 | U37501.   |
| HWMHG0  | 654 | 933534 | 1 - 615 | 15 - 629 |   |
| 6       |     |        |         |          |   |
| HWMHG2  | 655 | 957665 | 1 - 512 | 15 - 526 | AA707467, AW292400, and AL122104.   |
| 6       |     |        |         |          |   |

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| HWMHS10 | 656 | 961647 | 1 - 742 | 15 - 756 |   |
| HWMHT22 | 657 | 917570 | 1 - 667 | 15 - 681 | AL117342.   |
| HWMHX1  | 658 | 914007 | 1 - 724 | 15 - 738 | AF048727.   |
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| HWMHZ25 | 659 | 951699 | 1 - 341 | 15 - 355 |   |
| HWMID39 | 660 | 915686 | 1 - 490 | 15 - 504 |   |
| HWMIR03 | 661 | 922302 | 1 - 322 | 15 - 336 |   |
| HWMJB68 | 662 | 914031 | 1 - 386 | 15 - 400 | AI431513, H53217, H60249, R95840, N72170, AA470567, H66577, AW167773, AL048275, AA975894, N22465, T50061, H78898, AA503298, AI371208, AA299589, AI565126, AI610737, AA405726, AA492105, AW068580, AA303131, F00564, AW089916, AA713705, AA368155, AI678992, F35663, AW021674, AI745335, AA015948, AC002302, AC005520, AL031228, AC005409, AP000692, Z86090, AC006449, AC004253, AL035071, AL033521, AC004526, AC004967, AC002425, AL109952, AC004796, AL035405, Z85987, AC005620, U91326, AC002544, Z83308, AC003101, AC007687, AC010582, AC004148, AF049895, AC006316, AC005284, AC004890, AC007226, AF196972, AC005484, AC004000, AC007216, AL133448, Z83844, AC006511, AL049760, AC007637, AC003695, AC000025, AL096701, AC000385, AC005527, AF053356, AC004757, U63721, AF196779, AL022322, Z97876, AP000252, AL049839, AC005962, AL109984, AC002115, AL035420, AP000212, AP000134, AC007376, AF038458, AC004150, AC005846, U95742, AC005015, AL021397, U47924, AF134726, AC007387, AC006071, AC004491, AC005971, AL049776, AC004686, Z83826, AC007308, Z83843, AC005529, AL096791, AF165926, AC002470, AC005200, AC005519, AC006211, AC006057, AC004805, AC005488, AC007225, AC005697, AC006581, AL008582, AF045555, AC005777, AC005081, AF047825, AC005383, AC002045, AC005399, AC005031, Z98036, AC004975, AL080243, AL035587, AC009464, AC002476, AC004644, AL121603, AC006512, U80017, AP000512, AC005829, AC005370, AC006088, AC004832, AL022476, |

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| HWME50  | 663 | 933501 | 1 - 104 | 15 - 118 |   |
| HWMKI01 | 664 | 913841 | 1 - 658 | 15 - 672 | H43471, AI859744, AA635433, AI299882, AA071151, AW272815, AI679871, AI251024, AI309979, AA282951, AI479148, AI929796, AA610255, AI962030, AA743996, AA984829, AI932871, AL037714, AA602017, M78032, AA515728, AI636734, AI623364, AA397821, AL134216, AA722505, H43183, F18761, AA368155, M78026, AW341955, AA115865, AA557945, AA488687, H87936, AA469327, N68677, AI678476, AA643770, AI282629, AA846923, AL037856, AL042373, T07225, AA533408, AW408596, AW238495, AI348780, H77492, AI358514, AC004491, AL109865, U91327, AC004967, AC004000, AL022322, AC006509, AC005777, AL031282, AC007666, AC005516, AC000052, AL035089, AL031666, AF134726, AC006001, AL023879, Z95116, AC005082, AC005736, AL034420, AB023050, AC007030, AP000347, AL049872, AC000353, AC004033, AC005067, AC005602, AL035405, AL049776, AF196779, AL022318, AC004796, AP000346, Z98036, AC005500, AL035086, AP000694, AC004883, AC005274, AL049780, AP000313, AC002316, AC002425, AC015853, AP000547, AL031291, AF111167, AP000050, AL031681, AC005578, AB001523, |

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| AC005529, AP000117, AL031284, AC004019, AL021453, AC005225, AC002126, AF064861, AL133035, AP000690, AL109984, AC004983, AC020663, AL031848, AC006077, AL031670, AC007308, AC005899, AP000008, AF053356, AC006023, AC002090, AC005220, AC005015, AC016025, AP000704, AC005488, AL049569, AC004242, AC005231, AL035420, AC003663, AC004752, AL035659, AC004832, AC007052, AC005412, AF111168, AL136295, AL031311, AC005670, AC007199, AL117339, AL117354, AL034429, AC005914, AL049694, AL117694, AC004477, AC002470, AL031846, AC005520, AC002350, AC003043, AF155238, AC005839, AL080243, AC006322, AL035410, AF003626, AC005081, Z98743, Z93020, AC005829, AC009247, AC004583, Z84480, AC007055, Z83826, AL109799, AP000104, AC005480, AC003030, AC006241, U80017, AC008372, AC006285, AL008583, AL096701, AC004257, AL049636, Z73359, AC003690, AF018080, AC005180, AP000692, AC007736, AC005911, AL031283, AC007688, AC005778, AC007358, AC005512, AL135783, AL023553, Z93241, AL133355, U95741, Z99716, AL022336, AC006088, AL122020, AC004884, Z98745, Z93023, AC004263, AC002504, AC005940, AC000073, AP000009, U82668, AC005932, AC005288, AC006538, AC007216, AL049539, AC004699, AP000688, AL049874, AC002546, AC004962, AC007955, AC005620, AC005005, AL049765, AC005678, AL035419, AC002301, AC004106, AL121603, AL021546, AC008126, AC016831, AC005730, AC004526, AC007227, AD001527, AC007546, AC004408, AC004706, AL031683, AL035658, AC006111, AF124523, AC002364, AL035587, AB020868, AC003029, AC007057, AL031680, U07562, AF045555, AC006450, AL133163, Z99128, AC008044, AF118808, AF196969, U52112, AC004882, AL049839, AC004150, AC005837, AC002300, AP000090, AL022238, AC007731, AC004765, Z74739, AC005971, AC006120, AL031577, AC005233, AC005821, AP000350, AL031733, AL034417, AC002558, AP000555, U91318, |  |  |  |  |
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|             |     |        |         |          |  | AC004841, AC005360, AC005332, AL049843, AC005037, AP000228, Z98044, AF091512, AP000510, AC004593, AC006257, AC004859, and AF111163.   |
| HWMKI10     | 665 | 961616 | 1 - 513 | 15 - 527 |  | AA365382, AF155219, AF149877, and AF126427.   |
| HWMMLG23    | 666 | 961110 | 1 - 233 | 15 - 247 |  | AA353040, AA383720, AA382189, AA133917, AI751877, AA315963, AA057016, RI3065, AF151802, and AF042284.   |
| HWMMA1<br>2 | 667 | 969173 | 1 - 240 | 15 - 254 |  | AW138984.   |
| HWMMG6<br>5 | 668 | 928823 | 1 - 768 | 15 - 782 |  | AW139091, AI434608, AA653723, AI658553, AI418050, and AI675691.   |
| HWMMS6<br>5 | 669 | 917513 | 1 - 603 | 15 - 617 |  |   |
| HWMMY6<br>6 | 670 | 966367 | 1 - 394 | 15 - 408 |  | N22506, AA358178, AL117339, AF205588, AL022345, AC005815, AC004126, and AC007766.   |
| HWMNC07     | 671 | 951724 | 1 - 37  | 15 - 51  |  |   |
| HWNAG05     | 672 | 928811 | 1 - 711 | 15 - 725 |  | AW170560, AA635931, C17038, C19030, RI1094, and D78833.   |
| HWNBJ06     | 673 | 933578 | 1 - 302 | 15 - 316 |  | AA213877, AL119483, AL134538, AL134920, U46349, AL043029, AL119355, AL134531, AL134533, AL043011, AL119497, AB002334, AR060234, and AB026436.   |
| HWNBS06     | 674 | 933587 | 1 - 399 | 15 - 413 |  | T28503, AW301137, AL079683, Z98473, AA832148, AI344844, AA483211, AA584749, HI6048, AA192695, T12272, T11542, AI951495, AI688846, AI345654, AI471691, F19258, AA457639, AW081359, AI015912, AA443065, AA366986, AA368745, AW276827, AW193432, AI205126, AW439558, AA515051, AI633478, AA843450, AL119391, AI282907, AI270343, AI352078, AI345522, AA079528, AI557323, AA338431, AI340453, AI184226, AA665192, AI890928, AI890570, AA659083, AW265197, AI284640, AI914706, AL133723, AI358343, F31204, AI889781, AA745560, AA745431, AA569284, AI801600, AW269639, AW238016, AW023672, AA515128, AI064952, AI633390, AI246796, AA658235, AI879000, AI433187, AA176924, AI674873, AI053786, AI721122, AI768968, AA169801, AA558003, AA779018, AI951436, AL041412, AA252620, AL042753, AI354540, AA364567, AA229785, AA457482, F28576, AI567786, |



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| AA775230, AA973575, AI569086, AA515435, AI138344, AA551509, AI349874, AA828856, AI038279, AW337985, AA682189, AI079910, AW243706, AA435854, AA837755, AA745362, AI252085, AW130799, AI445436, AI890052, AI252114, AI963786, AI890923, AI792903, AI274431, F31796, AI792864, AI733957, AI734002, AI929531, AI079645, AI431303, AI003743, AI003172, AI561335, AI679713, AA362700, AW162049, F31799, AL042856, F37223, AL046409, AI709365, AA501614, H64560, AA878954, AW074398, AW264973, F37286, W60516, AI493634, N99715, AW074398, AW172727, AW090811, AW193265, AW265393, H94871, AI474713, AA736963, AI872421, AI050007, F07193, AA630352, AW080134, AI678392, AA654979, AL120235, AI049722, AI345157, F24284, AA353408, N71724, AA652329, AA492244, AI124660, AI149915, AI345161, AA348402, AW104748, R97987, AI962050, R99852, AI350211, AI608626, AW238278, N74620, AA354311, AI341664, AW020483, C06327, AA579249, AI061334, F36273, AI435544, AA524832, AI039451, AA482711, AI287964, AI917271, AW169230, AI499094, AI471709, AA515224, AI471481, AW166815, AI939465, AI521618, AW069807, AA743956, AI613280, N25042, AI133721, AL046782, AI963720, AI761471, AI366071, AI679782, AI904894, AA470581, H13868, AW274064, AI914151, AA308806, AW327360, AA781504, AL038785, AW103415, AW270284, AW419118, F29989, AI818332, N43757, T40617, AA626678, AA535661, AI225141, AW406755, AI708009, AC005339, AC002492, U86136, AL035587, Z99916, Z83845, AC004152, AL132800, AL034429, AC003957, AC007878, AL022315, AL022166, AL031665, AB020862, AC004864, AL031673, Z98747, Z98950, AC007637, Z84484, Z82206, AL031279, AC006013, Z82188, AC005094, AC018633, AF001552, L35668, AF135187, AC005612, AL050348, AL035703, Z95114, AL021395, AC008062, AL133297, AL035685, AL035588, Z85987, L13709, X03273, AL031296, Z72519, AC007388, AL022238, AC005386, AF001905, |  |  |  |  |  |
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| AC005903, AC004804, AC004909, AE000660, AC005722, AL031432, AL049759, AC002395, AF155238, AC004989, AC006989, AC006115, AC002111, AL049556, AP000208, AP000130, AP000247, AC004915, AC005409, U87943, AL008719, AC006130, AC004263, AC007050, AC005696, AC004466, AL050341, AL078584, AL022395, AL133233, AC005324, U91321, AL031732, U34879, Z99570, AL034549, Z98050, AC002542, AC005873, AC006548, AC004381, AC004811, AC004755, AC006127, AC006237, AC002564, AC006966, AF002223, Z83844, Z98743, AC004254, AC002997, AC004559, AF041427, AF125348, AC004882, AL031446, AL021154, AL133371, AC004821, AC006040, AP000497, Y18000, AR060394, AL031280, X64467, AP000535, AC005057, AL022327, AF196971, AL035423, AL023806, U02507, AL031687, AP001054, AP000513, AC004692, AL008708, AC005944, AL031118, AC006061, AF064861, U95742, AL121603, AC003043, AL049553, Z84478, AC005597, AL033543, AC010169, AC007245, Z94277, AC005410, AC005820, AC002530, AC007014, AF015166, U02532, AL049569, AL031590, AC005387, AC005041, AL008716, AL132992, AP000025, Z99571, U57008, X53550, L13713, Z85989, L13714, AC006076, AC005954, AL022323, AJ238764, AC004990, Z97183, AF061032, AL031229, AC004070, AC002412, AC005589, AC002543, AC007308, AC002470, AC007240, AL031651, Z85996, AL031257, AL023513, AC005529, AC005895, AC004149, AC005940, U72787, AF042836, AC002352, AP001170, AF038667, AL031275, AC004150, AC006007, Z94055, AC006480, AJ006996, AC007193, AF067844, AC005585, L29766, AC005803, Z84474, AL034451, AC007899, Z98742, AF200465, AC006050, AC002381, AC006270, AC005296, AL121652, Z49816, AL008721, Z84718, AL035447, X55926, AL050312, AC003070, AC006965, AC004712, AC006565, AC005545, AL035634, AC006958, AC005694, AC005067, AC002301, AL022397, AC005532, AC005048, AC005527, AL009172, AL021026, |  |  |  |  |  |
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| HWNCY59 | 675 | 927487 | 1 - 224 | 15 - 238 | AA458703, AA476397, AA937427, AA618452, AJ334443, AA508359, AW270343, AW440497, AA126519, AL038705, AL045053, AA082567, AJ792231, AA551552, AA482953, H53828, AJ754253, AW084466, AW193410, AA216412, AA508902, AA547947, AL119691, AA657835, AW081165, AW275510, R73380, AA468244, W93917, AI002744, AA490183, AA431949, R02632, AI004704, AW192179, AA478355, R44116, AW238121, AA493975, AJ306191, AI305894, AI754653; AA838190, AI110844, AW302087, AI766906, AI954260, R45369, T69264, AW302080, AC004675, AC004656, AF088219, AC002123, AF165926, AC007510, AC005233, AC007564, AJ011930, AC005832, AF031078, AF030876, AL121652, AC005015, Z98884, AB026898, AL078638, AC007546, AC006965, AL031681, AC004815, AP000213, AP000135, AP000031, AC005399, AC005224, AL031311, AL035685, U95742, AL035423, AC007688, AL023799, AC007172, U91323, AC004841, AC007536, AC005291, AC016026, AC008014, AL020996, AC006978, AC004881, AC007566, AL031428, AC004159, AC002553, AC007537, AC002449, AL096711, AC003101, AL034402, AC006501, AC003029, AL031283, AC006333, Z98941, AL109984, AP000347, AC002289, AP000100, AC007226, AC005409, AC007161, AC005529, AC005229, AC004813, AC004230, Z83838, Z95116, U29953, AL035587, AC002991, AL035450, AC004821, AL049830, AC005280, AL049699, AC005480, AP000704, AC004549, AL031594, AL021393, AP000553, AC008044, AC007052, AL008732, AC005207, AP000498, AC004167, AC005069, AC009411, AC002470, AC005414, AP000556, AL035603, AF207550, AP000552, AC005971, AC005920, AP000008, AC005620, AC004019, AC005011, AP000959, AC008170, AC008372, Z93023, AC005932, AP000967, AC004934, Z81369, |

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|         |     |        |          |           | AP000503, AC005527, AL109952, AC005300, AL109865, AJ003147, AP000359, AC005578, AC005972, U47924, AC009516, AC006511, AL022320, AC005088, Z95114, Z97054, AP000253, AC002350, AC002312, AC004024, AC008994, AL023553, AF134726, Z86090, AL079295, AL133386, AC004400, AC006487, AL031680, AC005844, U91318, AC007684, AL078581, AC005231, AL035455, AC007227, AC004678, AC004526, AC007225, AC004485, AC006524, AC002369, AC005048, AC000379, AC004874, AC006111, AL022067, AC006101, AC002558, AL117352, AC005358, AC007363, AL049869, AC006998, AC006241, AC004686, AC004797, AC005362, AL021978, AL023280, AC006449, AC006285, AP000558, AL132987, AC010202, AC007216, AC005500, AC004890, U85195, AL031659, L78810, AC005952, AC004659, AC005725, AP000517, AC002549, AC016025, AP000513, AC002133, AF165142, AC005768, AC007055, AC005081, AC002115, AC012085, AC008040, AL109653, AC004929, AL133448, AC005251, Z82198, AC005495, AE000658, AC004099, AC006385, U52112, AC002430, AL035420, Z85986, AC002472, AF029308, U66059, AC005046, AC009247, AC004712, AC005288, AC005899, U95740, AC006288, Z94801, AC005180, Z98036, AC006138, AC007384, AC004832, AC005538, and Z86062. |
| HWNEO76 | 676 | 929720 | 1 - 347  | 15 - 361  | AC005752.   |
| HWNEX05 | 677 | 928784 | 1 - 231  | 15 - 245  |   |
| HWNEY06 | 678 | 933551 | 1 - 1000 | 15 - 1014 | AA193123, AI911922, AI379417, AI076484, H98484, D62790, and AC004219.   |
| HWNEZ48 | 679 | 933522 | 1 - 388  | 15 - 402  | AC007227.   |
| HWNGN09 | 680 | 961602 | 1 - 442  | 15 - 456  | AL045232.   |
| HWNHAI2 | 681 | 969205 | 1 - 769  | 15 - 783  |   |
| HXOA114 | 682 | 974075 | 1 - 622  | 15 - 636  | R82572, AI046024, AI048523, I05966, S50263, M31555, E06646, M16072, A29575, I25725, X72796, A73099, AF045504, AB016619, AF031634, Z15023, AF045485, Z21680, AF045486, M19900, X65087, L14358, M17770, S82492, M60239, AB028875, Z15019, AR034680, D12736, S67223, AJ242621,   |

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|             |     |        |          |           | M31278, Y13990, AF045505, M58570, A47281, D12730, AJ002433, U56408, U85491, U17476, A82600, A82599, Z15021, Z15022, M60249, L14356, M30483, L14357, I07390, Z15020, M90468, M36208, X74589, M34525, A43173, M30482, L14369, U88067, M27584, AB006832, Y17374, AF113109, L14368, U80190, M60745, AF056216, M83537, D14175, U50329, AR007979, M36230, S63552, D25498, AB015881, M27583, X65089, L14362, L14363, M90690, AR014066, L14366, D14174, M36233, X70098, M36214, M97872, M95938, X67796, X65088, X67800, X03301, A22466, X59174, A22469, X70096, AR007981, X70091, L30138, A57333, AR003778, A22539, A22470, A50960, A57349, A57353, A50995, L31895, A50993, A57337, A57341, A57351, A57343, A57345, A57347, L14365, X65090, AF127458, U89324, A38268, A38267, M91699, AJ250900, AF045023, X59210, L14367, AJ005354, L14364, M24786, X03300, AR059286, AF023242, U39900, U39899, M54977, M24785, X67190, X67191, M28834, A13735, A23165, L02346, U00927, M97861, X00894, AF045892, M19903, X57857, S72514, A44967, E08434, AB001737, AF134808, AF045895, U24114, M84437, E16346, M97876, E03802, I31960, M20835, AR042571, L24918, X14623, and AJ131750. |
| HX0AA67     | 683 | 974326 | 1 - 372  | 15 - 386  | AC007240, AC004104, AP000316, AP000118, AP000165, and AL023883.   |
| HWNHN10     | 684 | 961609 | 1 - 659  | 15 - 673  | AA912130, AI240479, AA815414, AI809506, and AA969138.   |
| HWNDU11     | 685 | 965382 | 1 - 479  | 15 - 493  | AA195743.   |
| HWNCN05     | 686 | 928791 | 1 - 942  | 15 - 956  | N93301, AI039653, AW268575, W25153, AI818415, AW271345, and AI675486.   |
| HWNBX05     | 687 | 928800 | 1 - 402  | 15 - 416  | H11279.   |
| HWNBL12     | 688 | 969222 | 1 - 432  | 15 - 446  | AL135067, AI378370, AI351880, AI138478, AA679780, and AC006344.   |
| HWNAL06     | 689 | 933591 | 1 - 466  | 15 - 480  | AA453147.   |
| HWNAE01     | 690 | 914082 | 1 - 1052 | 15 - 1066 | AA705184, AI247864, N92043, N68830, H53322, R50487, H53323, AI379225, and R50572.   |
| HWMG01<br>0 | 691 | 961716 | 1 - 303  | 15 - 317  | AW085802, W15495, AI510780, AW070676, AA678924, AI096738, AI699147, AA722955, AA228292, AP000692, and   |

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| HWMBY62     | 692 | 937234 | 1 - 665 | 15 - 679 | AB023150.<br>AA033973, AW204163, AI18304, AW081429, AI214706, AA399495, AA525779, AA631754, AA398154, AA515710, AA190519, AA190482, AA365169, AF109219, and AL137607.   |
| HWMBM8<br>9 | 693 | 968984 | 1 - 491 | 15 - 505 | AI762892, AI760766, AI189223, AI824008, N30895, AI927354, AA443809, AI372949, W81043, AI299589, AI934550, AA605197, W81079, AI168782, AW374587, AI538814, AW079505, and AA447177.   |
| HWMAE12     | 694 | 969692 | 1 - 728 | 15 - 742 | AA492421, H51230, AR028772, AC004601, and AC005684.   |
| HWLXJ10     | 695 | 963328 | 1 - 521 | 15 - 535 | AW000952, AW451313, AW028154, AW235849, AL042898, AL134524, AL045328, AL045327, AL047163, AL134110, AL037295, AL038838, AL038983, AL037335, AL037343, AL037323, AL037436, AI142134, AL047037, AL038878, AI547295, AL037443, AL037727, AL038532, AL038822, AL038761, AL037435, AL135012, AL040576, AL041955, AL045753, AL040472, AL039643, U46344, AL038745, AL039360, AL038651, D29033, AL049018, AL045891, AL048677, AL043089, AL042655, AL039432, AL043321, AL038040, AL043941, AL045494, AI318479, AL042523, AL048657, AL046356, AL038041, AL042420, AL042741, AL038024, AL042468, AW363350, AI547258, AL031651, AR066494, AL133053, AL122101, AL133049, DI7247, A93923, A93916, A93931, A85203, AL133074, and AR023813. |
| HWLVU33     | 696 | 972979 | 1 - 525 | 15 - 539 | AA775419, AI273235, AI754154, AI446402, AI640735, AI468600, AA602645, AA460180, AI675266, AI382693, R40043, and AA813916.   |
| HWLVK02     | 697 | 922696 | 1 - 580 | 15 - 594 | AA916685, AI913975, AI186460, N64366, AW003622, AI209045, AW383922, AI186495, AA988844, and AA505627.   |
| HWLUY15     | 698 | 874966 | 1 - 455 | 15 - 469 | AA813464, and AI299894.   |
| HWLQS70     | 699 | 933799 | 1 - 615 | 15 - 629 | AI692670, AI983514, AI659461, AA857943, AA848022, AW023325, AA150963, AA856775, AI333521, AI350586, AI057121, AI743582, AI093682, AI039079, AA811978, AA621091, AA737208, AI350364, AA522951, AW302375, AI381406, AA639131, AA903924, AA890276, AA210835, AA258236, AI690470, AA214632, AA736622, AI015154,   |

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|---------|-----|--------|---------|----------|---|
| HWLQA64 | 700 | 918932 | 1 - 237 | 15 - 251 | AA701126, AI015739, AW149922, AA259080, and AA743600.<br>R44785, AW296584, AI698918, AI435319, AI124890, N26029,<br>AI652245, AI524315, AA243863, AI743693, AI148476,<br>AA830427, AA934726, AI828768, AA481312, N27950,<br>AA602331, AA918069, AA463272, AI431707, AI858382,<br>AA644278, AI990803, AI081819, AI264927, AW274632,<br>AA283019, AI379553, AI830530, AA195654, AA234974,<br>N67908, N62389, AW300062, H97988, AA772368, AI824287,<br>AI590043, AI045619, AI866465, AA641818, AI539800,<br>AI815232, AI868204, AI500714, AI355779, AI581033,<br>AI537677, AI046466, AA715307, AA809974, AI538885,<br>AI042416, AI582932, AW025943, AI889189, AI554827,<br>AW055075, AI046618, AA761557, AI801325, AI859991,<br>AW162194, AI872423, AI494201, AI521560, AI500659,<br>AI500523, AI538850, AI471909, AI366900, AI923989,<br>AI284517, AI500706, AI445237, AI491776, AW151138,<br>AW151974, AI500662, AW172723, AI284509, AI440263,<br>AI889168, AI866573, AI633493, AI434256, T99953, AI273179,<br>AI805769, AI434242, AI888661, AI284513, AI888118,<br>AI436429, AI889147, AI371228, AI440252, AI491710,<br>AI047422, AI866786, AI860003, AI610557, AI242736,<br>AI433037, AI887499, AI539781, AI539707, AI433157,<br>AI923509, AI559957, AI521571, AI043168, AI042488,<br>AI671642, AW161202, AI439995, AI089469, AI890907,<br>AI582912, AI364788, AI039390, AW083804, AI539771,<br>AI343091, AW191003, AI309443, AI570774, AI828574,<br>AI923046, AI349276, AI048375, AI269862, AI887785,<br>AA748353, AC005575, S68736, X72889, AI122049, AI133637,<br>AI133113, X80340, AI133072, AI133080, AI122110,<br>AI133081, AI133077, AI137283, Y10655, AI122050,<br>AI049423, X70685, AI117583, AF081195, E07361, I17767,<br>U90884, AI137526, AI133640, I46765, AI117585, AI117578,<br>U49434, and AI122123. |
| HWLPN12 | 701 | 969572 | 1 - 445 | 15 - 459 | AI004958, AA481489, AA481174, F00376, T17269, AA503168,<br>AA664604, AI037910, AI292236, AI046782, AI633168,  |

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| AW338508, AW082744, AI582890, AA342562, AI357823, AA878149, AI952900, H62778, AA653612, AA665645, AA654321, AI049996, R92640, AI826845, AA577732, W45355, AA323085, AA603323, AI538540, AW021917, AA558298, R82388, W44373, AA297538, AA758266, AW117740, AA086318, AA582554, AI748803, AW148792, AI124798, AI678392, AA878140, AI830390, W01998, AA878431, AA037110, W01999, AW068316, R79597, AI536625, AA593471, AW082117, AL119555, F23255, H84359, AA634837, AI569982, AI709096, AA720732, AA477103, AI049598, H82330, AA879053, AI753113, Z85986, AC012599, Z99127, AP000502, Z96050, AL117352, AC002040, AC006318, AL031277, U62631, AC007347, AC002347, AL031120, AC002544, AL035460, AF134726, AC006254, AC007030, AC004765, AL109798, AC003043, AF117829, AC004222, AP000514, AC004448, AC003029, AC007637, AL031283, AC004859, AF003626, AC006262, AC004003, AC005300, AB020868, AC007736, AL022313, AJ246003, AL031650, AL008708, AC007666, AC006257, AC006013, AC005592, AL031282, AL031276, AC004256, AC004090, AC004983, Z82201, AC006538, AC004595, AC005529, AC005179, AC002073, AL049745, AC006312, AF037338, AC005288, AL132777, AC006026, AC007055, AC005839, AF121781, AC005377, AC003663, Z95331, AC004841, AC008012, AC005899, AC005921, AC006137, AL021395, AC004990, L29766, AC009514, AL023283, AC004150, AC000026, AC006132, AL021155, AL023879, AP000115, AL034417, AC002115, AF037222, AC002059, AC005531, Z84480, AL035415, AC005102, AL050306, AC006017, AC004655, AC005157, AL121769, U95742, U78027, AC004087, AC005358, L32588, AC004890, AL133448, AC006480, AC007216, AL031659, AL024509, AC007566, AC007671, AC005005, AL049795, AL049591, U82757, AC008498, AL035422, AB015355, AL031289, AL136295, U63721, AC005696, U91326, AC005520, AC005823, Z82244, AC003049, AC005745, U50537, AC006960, AL022068, |  |  |  |  |  |
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|         |     |        |         |          | AC006390, AC005209, AL133353, AC005494, AC004813, AC006948, AC002057, AL121767, AC008009, AL121748, AL034345, AC005488, AL121934, AL132992, AC006360, AC004949, AF196969, AC004024, AC007225, AL031846, AC005015, Z99716, AC007639, AF031078, AL022327, AC007919, AC004878, AC005763, AC005701, AC007899, AD000671, AL023575, AF030876, AF111168, AC006449, AC005291, AL022336, AC005736, AC005527, AC005004, AL008726, AC007537, AC004771, AC005827, AL049776, AC002366, AP000505, Z97876, AC002425, AL031055, AL049692, AL031005, AP000961, AL121603, AL109627, AC005971, AP000066, AL031670, AC004496, AC005037, AC011718, Z97054, AL034582, AP000553, AC004849, AC009516, AC007262, AC007226, AL121694, AC008372, AC005203, Z84483, AC004125, AC005740, AC005632, AC003083, AF111167, AL009031, AC002326, AC006116, AC003012, Z98749, AP000552, AC012398, AF061032, Z98051, AC008079, U91324, AC004955, U89337, AL022162, AP000689, AC006487, AL022316, AP000280, D83253, AL049869, AL031178, AC004812, AC004796, AC004874, AP000518, Z83840, AC005393, AL139054, AC005820, AL031682, AC005914, AL049696, AC004814, AP000039, AP000107, AL109657, AC009501, Z99289, AC005703, AC006277, and F01304. |
| HWLOL02 | 702 | 918320 | 1 - 424 | 15 - 438 | AW205701, AA885386, AA639272, AI185575, AI095130, AI539690, AA765760, AW150557, AW301409, AI866465, AL045995, AW022713, AA668621, AI859899, AI680221, AW129117, AI285448, AW079511, AI521136, AI373276, AL038185, AI913476, AL042899, AL042898, AW020693, AI921155, AC006313, AL049426, AF106657, and AF118070.   |
| HWLOB68 | 703 | 908500 | 1 - 592 | 15 - 606 | N20488, N25521, AW392670, Z99396, U46347, AL036418, AL038837, AL037051, AL036725, AA631969, AW384394, AL039074, AL119484, AW363220, AL036924, AL036858, AW372827, AL119457, AL038509, AL043003, AA648406, AL039564, AL039085, AL119497, AL039156, AL119439,   |

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|---------|-----|--------|---------|----------|---|
|         |     |        |         |          | AL039108, AL119319, AL039109, AL039128, AL119324, AL036190, U46351, AL043147, AL119443, AL037639, AL119391, U46350, AL037094, AL036767, AL039659, AL119522, AL037526, AL036196, AL119483, AL119363, AL119355, U46341, U46349, AL038531, AL119341, AL119396, AL119335, AL134519, AL037082, AL037077, AL119418, AL042909, AL134132, AL038520, AL119496, AL039625, AL039648, AL134530, AL045337, AL134531, AL134527, AL134528, AL119444, AL037205, AL036268, AL134533, AL042975, AL039678, AL039629, AL039386, AL037027, AL037085, AL134538, AL039423, U46346, AL037615, AL038851, AL039150, AL040992, AL042614, AF205588, AJ245586, AJ245587, AR066494, AR060234, A81671, AR023813, AR064707, AR069079, AB026436, and AR054110. |
| HWLNC88 | 704 | 875790 | 1 - 558 | 15 - 572 | AI634844, AI039734, AI373240, and AA558783.   |
| HWLNA36 | 705 | 974863 | 1 - 636 | 15 - 650 | AI767588, AI635347, AI640606, AI991689, AA977785, AI979247, AA971157, AI687230, AI873792, AA152394, AI244588, AA761110, AI126673, AA491080, AA679080, AI913234, AI920850, AI018184, AA702114, AA377229, AA436906, R81654, AI741350, R50230, AF222340, AF106037, AF183569, and AB011097.   |
| HWLMI16 | 706 | 918726 | 1 - 387 | 15 - 401 | AA427809, and T10788.   |
| HWLLZ91 | 707 | 887157 | 1 - 451 | 15 - 465 | AL022322.   |
| HWLLD02 | 708 | 930932 | 1 - 418 | 15 - 432 | AI452848, AW296319, AA928929, AI333232, N67650, AA558581, R37383, AI689843, AI002814, Z39760, R66421, AA634494, F09812, R43751, W37287, AL047118, T72545, H39739, F02269, AA214212, H21614, AI298767, AW294091, AW008823, AA127563, and AI421390.   |
| HWLKT19 | 709 | 974292 | 1 - 494 | 15 - 508 | AL119483, AA084401, AA714605, R48980, AA527963, AA149475, AA654482, AI475870, AW162750, AI362694, AA663074, AI928890, AL134920, AA309318, N23095, AW327422, AA020882, AC004167, AC006971, AC006543, AC006544, D86995, AF111168, Z92846, AC006251, AL080317, U66061, AL035658, AL021917, AL117351, AC008115, AC004890, AC006312, AC007387, AC007371, AC005736,   |

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| HWLQ11 | 710 | 965390 | 1 - 163 | 15 - 177 | <p>AL049779, AC003103, AP000692, AC004884, AC007199, AP000141, AC004858, AP000088, AP000696, AC004770, X87344, D87675, AC000134, AL031659, AF030453, AC005088, AL031278, AC006530, L44140, AL031774, AC002492, Z82190, AC004031, AC004079, AL031293, AL035458, AC005630, AC002400, AL035405, AC010206, AC008119, AP000555, AB000876, AC004181, AC004841, AB000882, AP000346, AP000501, Z69721, AC006146, AF109907, AF161221, AP000300, AP000045, AP000113, AF020662, AC005233, AL031257, AC005914, Z94277, AP000697, U95626, AC002994, Z82198, AC012085, AL080243, AC004887, AC004805, AC005740, AL008718, AF001550, AC000035, AC003695, AL031577, Z97053, AC002395, X89814, AL049856, AP000295, AC005480, AP000111, AP000043, AP000128, AP000206, AC004929, AC004150, Z84466, AC004477, AP000245, AC007011, AL035086, AL133448, AC007773, AC005529, AC006285, AL079342, AJ251973, AC002375, AC004242, Z98742, AC004883, AL121603, AL009181, and AC005921.</p> <p>AA825330, AA100338, AA313691, AA127036, H19273, AA025872, AA081777, AA360187, AI272649, AW388050, F34605, AW071109, H48768, AA358288, H68343, AA516214, H40478, AA643784, AA515728, AI811685, C75139, AI096714, AA772873, F24284, AA745302, AW245354, R96427, AW337805, R98218, AL079894, AW373645, AA602458, N34258, AA664924, AA565911, AI890971, H81406, AA653955, AI799569, AA808847, AI446259, AL048479, AW084431, AA315052, AI049709, AA447006, AA838192, AA323644, AI633386, AI192440, T86603, AA516328, T60316, AA653713, AI821382, AI820534, AL047480, AI921765, AA368659, AA525407, R67086, AI564215, AI003391, T85570, AW023515, W02749, AA349746, AA654482, AW408756, AA361513, AA365056, AA714899, AA808843, AA618316, T05617, AI207476, AA632993, AW162750, AW022891, AW074210, AA297698, AI299192, AW245860, AL134527, AA828834, R48980, AA577727, D87453, AF196971, AC006962, AC004757,</p> |
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| U02052, Z93244, AF207550, AC007191, Z82201, Z98050, AL050323, AC004706, AC006992, AP000432, Z29336, AP000253, AP000213, AP000135, AP000031, AC005782, AL021977, AL034420, AC008041, AL049536, AC006313, AC005189, AL133355, AL031186, AC008154, AL022311, AC003111, AC005006, AF031076, AL096712, AC007193, AC006480, AF001550, Z86090, AF024534, AC007421, AL034402, AC005086, AR036572, U91328, AL049570, AC002310, AC007868, AL035408, AC007993, AL034429, AL121658, AC004634, AL135959, AP000167, AP000052, Z82195, AL133304, AC004844, AF031078, AP000008, AC005520, AC005197, AC006449, Z82190, AL049198, AC004081, AF030876, AL117694, AC004552, AC005480, AC005274, U72790, AP000704, AC000035, AC006030, AP000207, AP000129, AC000025, AC005527, AP000245, U52112, AC006530, AC005529, AL049832, AP000510, Z46940, Y09781, U15422, AL035462, AP000289, AP000042, AP000110, AC005865, AL022326, AC004057, Z82184, AF146367, AF124523, AF118808, AC005342, AC005066, AL023284, AF205588, AP000090, AC005793, Z84474, AC006205, AL021528, U95742, AC007488, AC006120, AC007216, AC008275, AP001049, AF024533, Z98044, AL034554, AB023048, AC008062, AC002094, AL031659, Z75889, AL031670, AC004966, AC002347, AJ006995, AC007395, AL022328, AC005777, AC004687, AC002351, AC004382, Z84721, AL049653, AL035652, AP000089, AP000141, AB017602, AL121653, AC008273, AL024508, AC005535, AC005220, D87675, AC006479, AC004386, Z97056, AB020863, AC005239, AP000269, AP000103, AF196972, AC004655, AF106564, AC007182, Z83826, AL031589, Z83851, Z82243, AC005067, AC004223, AL020993, AC004668, AC002112, Z97206, AL034548, AC007011, AC007263, AC002365, AL049611, AC007014, AL096774, AL049729, X54156, U94788, AP000320, AC005902, AC004178, AC002984, AP000120, AL031286, AC005193, AC007161, AL035542, AL031729, |  |  |  |  |  |
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|         |     |        |         |          | AL031588, AC004583, AC009396, U91324, AC004491, AL031387, AC007773, AC004025, AL135960, AJ131016, AF111167, AC007308, AC002470, AC004771, AC005756, AC004707, AC005808, AF111169, L12582, AC005722, M64093, M29929, Z95115, Z49154, AC004030, AC005952, Z83733, AC004131, Z98743, and AL049749.   |
| HWLKJ18 | 711 | 930414 | 1 - 798 | 15 - 812 | AI270326, AA747375, AI446205, AW407919, AI927094, AW189068, AI683294, H54340, AA324186, AA593471, AI160117, AA469327, AA744272, R70333, AA744001, AA779783, AA745524, AI303008, AW270768, AA551798, AA744455, H21488, AA342256, AI245423, F04697, AA745588, AI672135, AA371567, F37169, AA085587, AA743966, AA603264, AI367523, AA586433, AA502568, AA716755, AA635433, AI264743, AA664604, AA846923, AA484228, AA342189, AW265393, AI284108, AI081147, AW008074, H58472, AI590404, AI568683, AW088130, AA669522, AA599080, AW104163, T40848, AA206629, AI148245, H91706, AW238016, AA828860, AI291037, AL043721, AW078909, AA284062, AA604395, AA350596, AA937686, AI701959, AA654482, AA228824, AI932871, AA358086, AI360514, AI583142, AI418529, AW277174, AA604843, AI798041, AI689019, AA557486, AW102955, AI917982, AW265009, AW440549, AW440492, T47739, AI978712, AA781504, AI367721, AA657741, W23546, AA384039, AA262752, AW406659, AI870453, AW069450, F03525, AI168205, AW085626, AW088559, AA568947, N45056, AI352078, AI570943, AL049872, AP000344, AL009181, AC006354, AC005667, Z82900, AC004929, AB011134, AC006014, AC008064, AL035400, AP000345, AL110122, U73638, AC005914, AC004211, AC006121, AL135745, AL023799, Z86090, AC005531, AC005206, AC005327, AC006441, AC006952, AC005264, AC006017, M87914, AC002425, AP000502, AC002422, AB023049, AC005911, AL121655, AL049829, AP000512, L78810, AC004973, AC003035, AC006312, AP000694, AC002126, AB023050, AL080243, |

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| AP000133, AP000211, AC004820, AC003078, AL078463, AC004815, U07562, AF019413, AC003973, AC005105, AL020997, AC005480, AC005828, AC009509, AL022726, AL034430, AC004470, AC008041, AC004963, AC006538, AC006953, U07563, AC003684, AP000511, AC004837, AC005768, AC005180, AL078639, AC002347, AC003664, AC004797, AL031257, AC003101, AL050318, M90058, AC006511, AL031774, D00591, U69730, AC005988, AC007686, AC006388, AC004383, AC005049, AC004595, U73636, AC011421, AC005785, AC004854, AC003104, AC005071, Z98051, AL031848, AC002055, AL049611, AC005280, AC006048, AC005619, D26067, AC005146, AC005971, AL117337, AC006468, AP000500, AC006111, AC005902, AC006327, AL096701, AL034370, AL096827, AP000557, AL035427, AC005877, AC005089, AC006021, AC004996, AC007731, AC005500, AL135744, AC004151, AL079334, AC000094, AC005903, AF112482, AC000085, AC003957, AC005245, U02068, D88268, AF205588, AP000509, AL133163, AL132987, AC007842, AC005081, U91321, Z81313, AC002045, U63630, AL021155, AL031053, AC005370, AC002301, AC006581, AC004975, AC004745, AL096791, AC004972, Z99716, AC004805, AL031393, AC007066, AC005192, Z98941, AL022315, AC004881, AL078621, U82828, AC006208, Z82214, AF064864, AF165176, AL035450, AC010168, AC006449, D84394, AC002511, AC001234, AL117328, AC006285, AC005232, AC005193, AL031577, U73332, AC005913, AB017602, Z30993, Z84721, AL035252, AC005316, AL034402, AC004976, AP000356, AC005317, AL035410, AC005399, AC006079, AC006162, AC008079, AL031676, Z95331, AC003070, AC004596, Z98052, AL024498, AP000116, AC004817, AL008637, AC005102, Z99943, AL022476, AL136295, AC007542, AJ251973, AC005011, AL079295, AL121653, AL049697, AL008718, AC004531, AC006965, AC004955, AL121658, AC005007, AC006427, AC004782, AC006211, AL109827, AC006042, AC006084, AC006088, |  |  |  |  |  |
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|          |     |        |         |          |  | AC007064, AC005839, AC005778, AL022396, AC004032, Z49235, and AC008040.   |
| HWLJKJ03 | 712 | 922371 | 1 - 520 | 15 - 534 |  | AA902430, AI681252, AI879991, AL080276, and AF202257.   |
| HWLJW12  | 713 | 969556 | 1 - 560 | 15 - 574 |  | AW054698, AA642512, AI378060, AA494486, AA536108, AI823838, AA502907, W56244, AI963205, AA663127, AA587968, AI859142, AW069188, N23036, AI024942, and AL117639.   |
| HWLJW11  | 714 | 924518 | 1 - 500 | 15 - 514 |  | W60263, AA781074, AA004225, AI698018, W04286, AA235149, AI948978, AA977744, AW013825, AW301584, AI719432, W60314, AW392370, AI678934, AA747067, AA746945, AA234751, AW382644, AA654607, AI349272, AA307294, AA307292, and AC004985.   |
| HWLJU91  | 715 | 789882 | 1 - 501 | 15 - 515 |  | AI660842, AA132964, T70354, AA587170, AI473318, AW339181, and AI471705.   |
| HWLJP28  | 716 | 925655 | 1 - 440 | 15 - 454 |  | N95385, AW083800, AA996318, AI271604, AI084115, AA854349, AW276544, AW247346, AI373017, AW001509, AA195247, AI139246, AI139463, AI066681, AI066683, AI884736, AI948653, AA463989, AA243640, AI188854, AW001474, AA973976, AA514447, AI523850, AI082808, AI223410, AI288210, AW246721, AI870011, AA861211, AI471823, AI693037, AA421035, AI086153, AI768262, AW005672, AI159904, AA515681, AI621122, AI379956, AW196296, AI697046, AW054883, AI208302, AI359604, AA176600, AI634195, AW341997, AI298008, AA148653, H23135, AA481989, AW069378, AA176960, AA399227, AI351955, AI202782, AA906678, AA258378, W74136, AI589127, AA745713, AA706773, H39661, AA828210, AA481999, W79674, AI183872, AI272018, AA768685, AA176831, AA977112, T33485, AA989448, Z41804, AI359380, AA368962, AA865669, AA975159, H89978, AI432354, AI911220, AI015167, AI418891, AI383671, F26818, F17274, AI972992, AA748828, AA458602, AI865762, F03711, AA599652, D19842, AW388587, AA291674, AA292183, AA975485, F29808, AA481856, AA481836, AA421034, AI219176, AA405298, AI362948, AL133634, AF159063, and |

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|---------|-----|--------|---------|----------|---|
| HWLJM40 | 717 | 710519 | 1 - 546 | 15 - 560 | AF112215,<br>W60827, and AL047234.  |
| HWLJK01 | 718 | 914089 | 1 - 616 | 15 - 630 | AA746173.   |
| HWLJS95 | 719 | 795416 | 1 - 255 | 15 - 269 | AI699874, H51304, AI783850, R18531, AI690301, H51898,<br>H02058, AA761876, AA769559, AA601182, AA485941,<br>AA634147, AA374166, R60198, T47172, AI124664, AA314294,<br>R79025, AA468322, AI027602, AI925653, AA305334,<br>AA487500, AW195949, AI922828, AA708021, AA069589,<br>AA059369, F00487, AA632845, AA745581, AI924702,<br>AL040573, AA032022, AA031911, AA312605, AA429675,<br>AI014920, AA324750, AA664564, AA555313, AA907537,<br>Z99496, AC005279, AC005567, AL050312, AC002312,<br>AC005288, AC002310, AL049548, AC006196, AC004491,<br>AC005808, AC009479, AL022318, AC002350, AC006374,<br>AC006449, AC004707, AC005296, AC010077, AF064861,<br>AC002299, AC005393, AC005327, AC005668, AC003036,<br>Z93241, AC006031, AC005783, AC005572, AL008720,<br>AL031577, AL035458, AC004905, AP000510, AB023048,<br>AC007015, AL118507, AF126403, AL031848, AC005015,<br>AL031054, AL021407, AC006077, AL121578, AL049631,<br>AF053356, AC003960, AC006359, AC002554, AC002451,<br>AP000563, AC004813, AC008044, AC003103, AL008582,<br>AC006597, AC004217, AC006505, AL008583, AC002559,<br>AL121603, AL109829, AC007227, AC005875, AC016830,<br>AF198098, AC007435, AL033533, AC006071, AL080317,<br>Z99495, AL133321, AC006390, AJ239318, AL035695,<br>AL049776, AC005187, AL024474, AC009247, AC006163,<br>AC002300, AF023268, AL031120, AC006042, AC016027,<br>AF130343, AC004934, Z83846, Z68289, AF111168, AC006132,<br>AC004620, AC009731, AC006947, AC002429, AL122003,<br>AL139054, AC006486, AC004838, AC006361, AC002470,<br>AB016897, and AC004072. |
| HWLIG05 | 720 | 928226 | 1 - 384 | 15 - 398 | AA055095.   |
| HWLID27 | 721 | 682563 | 1 - 482 | 15 - 496 | H01418, and AL109758.   |
| HWLHW0  | 722 | 915161 | 1 - 530 | 15 - 544 | AA923671, AI125697, and AC007239.   |



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| HWLHU03 | 723 | 922931 | 1 - 522 | 15 - 536 |  | AA078565, and AC005071.   |
| HWLHK09 | 724 | 949288 | 1 - 777 | 15 - 791 |  | AA740397, AI434125, AW136838, AA569863, AW105266, AI204298, W96043, AA716410, AI350484, AW290890, AW148513, AA447782, T53415, AI536855, T53416, R60197, AI984348, AI686362, AI248525, AW250847, AI992202, AI143894, AI992194, AI475478, AI805451, AI497917, AI131385, AI537372, AI138451, AW050818, AI188044, AI341988, AI092923, AI422529, AI470405, AI074107, AI761422, AI081852, AI240543, AA552656, AI741631, AA640107, W94806, AI709345, AI890651, AI741642, AA635765, AI000886, AA609560, R59720, AA279104, AA662394, AA960820, H43861, F26986, AI077909, AI266399, AW089381, AI022218, F33558, AW009700, AA454904, AA040893, W48641, N80191, AA029173, AA150947, D60131, AA018731, H08872, AI924093, N80837, H96895, AW408361, AA565574, AW090493, AW299693, AI799761, AI932812, AI800835, AI280339, AI798566, AA113310, T98488, AA161054, AW273622, AI653931, AI920904, AA720931, AA877404, AI276048, AI623560, C75200, AA654134, AI422772, AW134730, AW196781, AI583539, AI565141, AI689249, AA159367, AI800218, AI201482, T77050, AW193090, AI983710, AI306731, AI911743, AI346281, AI826240, AI312053, AA159139, AW193893, AW026429, AI955668, AW058431, AA150536, AI566956, AW264048, F09634, AI984335, AI031629, AA922838, AA983373, AI970021, W37151, AI610137, AI468182, AA828386, AI264211, AI023818, AA603941, T56771, AI659590, AA477573, AI050718, AA194496, AI701189, AI382466, H15148, AA565554, AI696419, AA159069, AW438920, AA496449, AA102717, AA248169, AA496515, AW024803, AW168713, AI955982, AW070799, AI244082, AI910614, AA526367, AA454830, W45378, AW129533, AW024804, AI766300, AA889374, N26161, AW176258, AW073374, AI362836, AA370818, and AL117551. |
| HWLHH62 | 725 | 876225 | 1 - 512 | 15 - 526 |  | R76336, AI290972, AW082282, AI815098, AI935867, AI659188,   |

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|---------|-----|--------|---------|----------|--|
|         |     |        |         |          | AI421829, AA974182, AW276067, AI889106, AI625318, AI636809, AW079674, AI559518, H12385, AI914585, AI342309, AI216199, AI336447, AI336445, AI476296, AA865622, AI301940, AI469758, AW251068, AI272699, AI832439, AW151910, AA573785, AI660665, AI333305, AI865986, AI688082, AA639087, D45438, R94963, C20912, AI908555, AA987621, H41084, AI590410, H70884, AI720940, H15022, AI274107, AA903732, AA935031, AW192993, AW132153, AI244423, AI199655, AI199654, AI832803, AA593195, AW269879, AA86276, AI110653, AI225252, AC006479, and AF115384. |
| HWLHD19 | 726 | 887203 | 1 - 618 | 15 - 632 | U46349, AW392670, AL119355, Z99396, AW372827, AL119483, AL119401, AW363220, AW384394, AL119341, U46351, AL119418, AL119319, AL119457, AL119396, AL119324, AL119443, AL134536, AL119522, AL134902, AL119484, AL119363, AL119391, AL119497, AL042984, U46346, U46350, U46347, AL119444, AL119335, AL119496, AL134525, AL037205, AL042433, AI142131, U46341, AL119464, AR060234, AR066494, A81671, AR069079, AR054110, and AB026436.  |
| HWLGV14 | 727 | 967914 | 1 - 441 | 15 - 455 | R95048, H71284, AW250334, H39231, H15021, AA309046, R45920, AI110653, AF115384, and AC006479.  |
| HWLGA04 | 728 | 925682 | 1 - 560 | 15 - 574 | AA805357, AW445088, AA457154, AA748596, and AA766556.  |
| HWLFY91 | 729 | 789569 | 1 - 587 | 15 - 601 | T55064, AL119418, AL119484, AL119483, AL079683, AC006480, AC005585, AC004966, AC004031, and AC007786.  |
| HWLFY06 | 730 | 934635 | 1 - 651 | 15 - 665 | AI828037, AI568552, AI911104, AI566345, AI768789, AA779329, AA693540, AA776299, and AW081695.  |
| HWLFV52 | 731 | 950978 | 1 - 344 | 15 - 358 | AA446725, and AW452377.  |
| HWLFQ39 | 732 | 705200 | 1 - 861 | 15 - 875 | R56641, R85020, T10207, R60097, Z43394, F11340, H28844, T66406, F06322, F12312, F11134, F05772, T80510, AI912281, AW419361, F06032, T06213, and AF070541.  |
| HWLFM69 | 733 | 754644 | 1 - 547 | 15 - 561 | AA236233, and AA253152.  |
| HWLFH36 | 734 | 708387 | 1 - 396 | 15 - 410 | AW025980, R63208, AW392670, U46347, AW384394, AL119484, AW363220, Z99396, AL119457, AW372827, AL119324, AL119319, AL043003, AL119497, AL119439,  |

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|         |     |        |         |          | AL119391, AL119522, U46351, AL119363, AL119355, AL119443, AL119483, AL119341, U46350, U46341, AL119396, AL134528, U46349, AL119335, AL119496, AL119418, AL119444, AL037205, AL134530, AL134519, AL134531, AL119401, U46346, AL042614, AL134132, AL134533, AL043147, AL042984, AL042965, AL042975, AL042544, AL119399, AL134538, U46345, AL043033, AL043019, AL042542, AL043029, AL042450, AL042989, AL042551, AL134542, AL119464, AR066494, AR060234, A81671, AB026436, AR054110, AR023813, and AR069079.   |
| HWLFB71 | 735 | 759915 | 1 - 758 | 15 - 772 | N99523, and AL035252.   |
| HWLEZ11 | 736 | 966228 | 1 - 543 | 15 - 557 | T50894, AI565243, and AW197960.   |
| HWLEQ61 | 737 | 741224 | 1 - 502 | 15 - 516 | R15994, Z39969, F04171, F03124, T40928, AI539854, AI146310, and T66620.   |
| HWLEM80 | 738 | 886651 | 1 - 756 | 15 - 770 | Z99396, AW392670, AW372827, AL038837, AW384394, AL119484, AL119391, AW363220, AL119497, AL037051, AL036725, AL119319, U46349, AL119483, AL119355, AL036418, AL119522, AL119457, AL119443, AL119324, AL119363, U46350, AA631969, AL039074, U46341, U46351, AL119341, AL119335, AL036858, AL119496, AL119396, AL119439, AL119444, AL119418, U46347, AL036924, AI142137, AL042614, U46346, AL037205, AL134524, AL042984, U46345, AL134538, AL134531, AL134542, AL042965, AL042975, AL038509, AL134528, AL119399, AL134518, AL043029, AL042544, AL037085, AI142132, AL037094, AL042551, AL043019, AL037526, AL043033, AL036196, AL043011, AL037639, AL036190, AL042450, AL042542, AL037082, AL036767, AL038520, AL037077, AL043003, AL036268, AL119464, AL036774, AL036998, AL038851, AL038447, AL036238, AL036733, AL037027, AL037178, AL037615, AL036719, AL036679, AL036765, AL036191, AL036886, AR060234, A81671, AR066494, AR023813, AR064707, AR069079, AB026436, and AR054110. |
| HWLEM01 | 739 | 915547 | 1 - 366 | 15 - 380 | AI627456, AA935090, AA862195, AA761568, and AA886022.   |
| HWLEL08 | 740 | 860161 | 1 - 675 | 15 - 689 | AI799364, AI254420, AIS72717, AI869403, AI799472,   |

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| AI811307, AI887247, AI831136, AA603709, AI244380, AW059713, AI802711, AI866741, AI631216, AI679959, AW242479, AI858310, AW104146, AI742026, AI691088, AI590787, AW079436, AI690946, AI589267, AI805638, AI499986, AI611743, AW083804, AA864406, AW265004, AI364788, AW152550, AI627988, AI648508, AW274355, AI890806, AI538764, AI696186, AI678762, AI073952, AA830821, AI683255, AI537735, AI874166, AI677797, AI554544, AI591412, AI285419, AI591081, AI536910, AI696626, AI864827, AI690449, AW088944, AW302924, AI624529, AI891157, AI679550, AW172723, AW193203, AI355277, AL040694, AI916419, AA829541, AW168503, AW084059, AW131999, AW088899, AI568138, AI288116, AI566630, AW263804, AI251830, AI289542, AW129271, AI867042, AI366549, AI636719, AW080205, W33163, AI446124, AI799650, AA983883, AI590423, AW090058, AI589993, AI678850, AI336575, AI537837, AW058233, R66759, AW193134, AI582871, AI963068, W46547, AI933992, AI632303, AI690312, AI433976, AW024889, AI288285, AI362637, AI473528, AI799657, AW403717, AA494167, AL046463, AI699255, AI677983, AI472536, AI288152, AI699011, AW161579, AI624668, AI564602, N74355, AW080214, AL036652, AW130863, AI783861, AW103371, AI921176, AI868831, AI950664, AW118414, AW021373, AI689420, AI678302, AI491710, AI368868, AI446605, AW409775, AW088144, AI540832, AI432040, AI280670, AI635464, AL040602, AI634450, AI539771, AI612843, AI567935, AI915576, AI857797, AI344928, AI537011, AI609594, AW131989, AI345737, AI345224, AI591074, AI619781, AI249946, AA760697, AI628324, AI432570, AW148621, AI345736, AI798258, AI539153, AI955906, AI553669, AI570966, AI336592, AL038575, AI890057, AW073697, AI874351, AI929108, AI620093, AW118373, AI311892, AI873638, AI567978, AI886055, AA908294, AI590761, AI292249, AI811845, AI912288, AI302559, |  |  |  |  |  |
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| AI590645, AI889839, AI888482, AI752007, AI805688,<br>AI872159, AI344933, AW103228, AI038529, AI862324,<br>AI886594, AI365256, AI669639, AI866082, AI148272,<br>AI470293, AA806719, AI687568, AI866994, AI591057,<br>AW192288, AI473598, AW085786, AW151847, AI250627,<br>AI863256, AI446373, AI471662, AW090103, AI349933,<br>AI573026, AW148716, AI307736, AI866608, AW268261,<br>AW073898, AI436429, AI473451, AI306706, AW082532,<br>AI537677, AW084097, AI249877, AI873644, AI872300,<br>AI263584, AI609677, AI888621, AI612759, AI357599,<br>AI539800, AI679179, AW104141, AI865320, AI242736,<br>AI345253, AA848053, AW149876, AW079334, AI040241,<br>AW089006, AW087938, AI289310, AI345677, AI500523,<br>AI623682, AI560679, AW073699, AI8777, S77771, A93016,<br>AL137556, I48978, S79832, AF022363, AF132676, AF061836,<br>AL137555, I89947, A08913, AF036941, I89931, AI122106,<br>A08912, A08910, I49625, A08909, E15569, AR038854,<br>AL133093, A08908, S76508, I89934, A08916, AC002467,<br>X72387, AF106862, E15582, X93495, AL122123, AF118070,<br>AL122050, I66342, U51587, AF078844, AL049938, I26207,<br>AB025103, AF030513, X56039, AL133098, AL049452, S69510,<br>A57389, AL137526, U92068, U95114, X55446, U96683, S68736,<br>AF106657, AF182215, D83989, I89944, AR019470, AF143957,<br>AL110221, A90832, AL117440, AL122118, AL049465,<br>AL137537, AL133104, A08907, AF114170, AF118064,<br>AR038969, AF051325, AL133645, AL122111, Z82022,<br>AJ238278, X92070, AF017152, AL117578, AL122045,<br>AL133077, AB029065, X53587, AL137539, AR034830, I96214,<br>I09360, AL049460, U90884, I42402, AL110197, I17544,<br>AL133557, AL080158, AL080127, AL133568, AI133014,<br>AF185576, AF180525, AL117432, X96540, I22272, AL137276,<br>I41145, E03348, X06146, AF065135, E03349, AF107847,<br>AL133624, AR059958, AL117629, AL137294, U77594, X65873,<br>AL133665, E02221, L04504, U72620, A58524, A58523,<br>AL137300, AF111112, Y10080, AL080060, AF067790, |  |
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|         |     |        |         |          | AF012536, AL137429, AL133067, Y16258, Y16257, E02756, Y16256, AL137557, X87582, E05822, AL110196, AR000496, U39656, AL117626, AL137538, X84990, X59414, AF090886, AL137712, A45787, AL137495, AL080137, AL137705, AL137527, AL133619, AL050138, AF137367, X62773, AF000145, AJ012755, M92439, S78214, A18788, AC004686, X81464, U75932, S75997, AF113019, I48979, AF090934, Y16645, U67958, AF118090, AL080154, AF210052, AL110296, AF183393, AF153205, AF159615, AL117585, AL117649, AL137711, E07108, U87620, AF090903, AF125949, AL137488, AF032666, D83032, A08911, AF162270, E02152, AF207750, AL133637, AF100931, AL122049, AL080074, AL133081, U58996, AL096744, AL137547, AL050393, AL133606, Y08769, AL050277, AL117583, L13297, AF118092, AF026030, U00686, AF040751, A27171, AF016047, AL137463, AF169154, U00763, S61953, AL080086, AF119337, I18355, AF118094, X79812, I34392, E02253, U75370, AL133640, X80340, Z72491, X52128, AL049466, AF094480, AL122098, AB007812, J05032, U42031, AF113676, AF158248, U49434, AL137658, AF146568, U80742, U72621, AL133113, AL050092, X57961, AL133565, AF008439, AF081197, AF081195, AF002985, A21103, AL122110, AF028823, S78453, AF113689, and L19437. |
| HWLEK75 | 741 | 766928 | 1 - 621 | 15 - 635 | AA191612, H46176, A1479578, T79613, A1936360, and AC006006.   |
| HWLEI57 | 742 | 734267 | 1 - 455 | 15 - 469 | AL041375, AA557945, AA911515, AA053463, A1310992, A1300818, A1250552, A1251034, A1254770, A1284543, A1054090, AA503019, AA206707, A1251284, A1251203, A1249853, AL044701, A1623364, AA788592, AA630535, F17537, AW303098, T54783, AA493808, AA135761, AA736713, AW084004, H27165, A1572680, AA364082, N49298, AW276678, AA480486, AA580251, AA469230, AA832016, A1524193, Z84474, AC004883, AC000353, AC007664, AL121603, AC005821, U78027, A1246003, AL109627, AL132712, AC007308, AF053356, AC005225, AL031681, AP000694, AC007371, AL031848, AC006211, AC004797, AC005280,   |

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| AC002310, AC005015, AC005755, U95740, AC005902, AL049538, AC005736, AC005696, AF129756, AC002470, AC005913, AC004019, AC005670, AC006966, AL133245, AF109907, AC006285, AL035681, AL049780, AL121757, AC005519, AF030453, AC006449, AC007055, AL121655, AC006126, AC004144, AL021707, AC004975, AL096701, Z84469, U85195, AC007227, AL035422, AL035684, AC000026, AF165926, AC005527, AC004813, AL133448, AC004099, AL009181, AC005089, AB003151, AC003029, AC004814, AC005695, AL050341, AL031255, AC005940, AC004477, AL034417, AL034347, AE000658, AL020995, AC002059, AC004686, AC016027, AC020663, AC005049, AC002492, AC016830, AP000501, AC007216, AC004526, AF181896, AC006511, AC005694, AL022726, AC004878, AL022326, AL031295, AC004491, AC006450, AL139054, AC005288, U62293, AC006396, AC006487, AC000159, AC004967, AC005412, AP000030, L78833, AP000116, AC007151, AL109801, AC005041, AL022336, AC005375, AC004816, AP000555, AC018633, AC004983, AL031767, AC005529, AL050318, AL078476, AC002477, AF205588, AP000212, AP000134, AL122020, AL121754, AC005057, AL031133, AL022320, Z83844, AL031311, AC007688, Z98047, AC000111, AL031659, U80017, AC016025, AC004079, AL049631, AL031733, AL022165, AL035458, AC005823, AC000120, AL008719, AL031673, AL024498, AC006480, AL049697, AC004890, AL049776, AL022323, Z95113, AC006115, AL035398, AC002316, AC002544, AC005808, AF001549, L44140, AL109758, U47924, AC006057, Z99716, AC007536, AC005399, AC007406, AJ003147, AC005740, AC004098, AC004938, AC004263, AL133353, AL033392, AC004448, AC005899, AB016897, AC006111, AC004150, AC007917, AC005261, AC006116, AL034420, AL117337, AP000245, AP001053, Z94056, AP000553, AC006538, AC005531, AC007225, AL031431, AF111168, AC004659, AC005971, AL049743, AC006597, AC006312, AC006441, AC004149, |  |  |  |  |  |
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| HWLEH70 | 743 | 874721 | 1 - 590 | 15 - 604 | AF196969, AC005697, AF134726, AL034549, AC006023, AP000503, AC007537, and AC007546.<br>W95010, AW374112, AA040829, AA836635, AA970717, AA314614, AA452356, AA476400, AW024516, AW129435, AI092491, AW072060, AI189134, AI150134, AA699453, AI263271, AA761739, AA703279, AA777528, AI342713, AA872292, AA843158, AI306603, AA844071, AI313465, AI301275, AA700663, AI032928, AA694526, AI040112, AA029630, AI802249, AI199009, AA776987, AA603711, AI720350, AA581863, AA034078, H68850, AA001365, N29685, AA092097, N89776, AA453539, AA775544, T62617, AI365084, AA877094, W52538, AA612919, AA029629, AW178377, T78021, R99078, AI080297, AA04832, AI620227, H01073, AI216849, N2722, AA039446, W01129, AI310514, H83755, AA380107, AI051240, AA361143, AA115074, AI290791, AI859418, AI859411, AI986177, AI084639, AA039371, AA777506, AA507629, AI675135, AI886105, W17298, AA887931, AA702656, AA232398, N56695, N56643, AI042295, AA173895, AA173539, AI458814, R99621, AA769877, H04197, N89377, W93148, AA824483, AI858388, AW070969, AA352755, AA677474, AA808719, AA516411, AI493901, AI478868, AI034012, AI340978, AI688193, AI128512, N30311, AA814454, AI969239, AW169015, AI090574, AA873007, AI079514, N52956, AA452133, AA937208, and AA465533. |
| HWLEF27 | 744 | 682572 | 1 - 256 | 15 - 270 | R13584, and AB011117.  |
| HWLEA48 | 745 | 927676 | 1 - 415 | 15 - 429 | AA130828, AF169034, Z98752, and AF169033.  |
| HWLDX03 | 746 | 922806 | 1 - 568 | 15 - 582 | AL133990, AI829770, AA505700, and AI128582.  |
| HWLDB04 | 747 | 887051 | 1 - 493 | 15 - 507 | AW117683.  |
| HWLDM06 | 748 | 934117 | 1 - 459 | 15 - 473 | AI818839, and AA557932.  |
| HWLCG42 | 749 | 975246 | 1 - 672 | 15 - 686 | AW075378, AL119483, AL119444, AL119484, AC006101, and U91323.  |
| HWLCD10 | 750 | 974071 | 1 - 473 | 15 - 487 | AW392670, U46347, AL043003, Z99396, AL119457, AL134528, AW363220, AW384394, AL043033, U46351, AL119324, AL119444, AL119363, AL134533, AL134531, AL119497, AI142132, AL043147, AL134132, AL042450, AR054110, and  |



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| HWLBO06 | 751 | 934630 | 1 - 306 | 15 - 320 | AR066494.<br>AI628414, AW190183, AA505080, C21450, AA629929, and<br>AA725256.  |
| HWLBN90 | 752 | 787355 | 1 - 597 | 15 - 611 | AA194905, AA164603, and AF155115.  |
| HWLBL75 | 753 | 766877 | 1 - 634 | 15 - 648 | AW005748, AA923548, AA287724, AA046075, AA280716,<br>AI215902, AA579688, N94002, AA046023, AI766599,<br>AA740808, T92453, AA287725, T91495, AI540782, AA489673,<br>AA281431, AW172264, AW419052, AC005667, and AC005206.   |
| HWLBI01 | 754 | 919168 | 1 - 329 | 15 - 343 | T84925, AI453533, AA662451, AI797910, AI863269, W49529,<br>AA969280, AA909645, AW016106, AA704629, AI217567,<br>AA253458, AI583564, AI268910, AI261516, AI223214,<br>AI080077, W49530, AW452178, AI423758, AI685699,<br>AW264194, AI424097, AI494222, AA161335, AA861082,<br>AI359963, AI278825, AI087203, AI292023, AI348189,<br>AI422074, AI356252, AI700817, AW003844, AA833762,<br>AA437126, AA765993, W56681, AI240846, AI933190,<br>AA777656, and AF053356.  |
| HWLAU04 | 755 | 953433 | 1 - 277 | 15 - 291 | AI014455, AI816843, AI934427, AW207409, AA594108,<br>AW439577, AI921123, AI818217, AW301697, AI128260,<br>AW270896, AW243099, AI923407, AI304364, R44786,<br>AI269569, AI022996, AI962499, AW205076, AA860774,<br>AI023565, AI675320, AW236056, AA846210, H20525,<br>AL043236, AA189144, AW188621, AA398933, AI682364,<br>AI869776, AI972233, AI436782, AI097649, AA492565,<br>AW194337, AW337725, AW150303, AI911832, AI783975,<br>AA427732, AA976448, AI423327, AA705924, AI122228,<br>AI933805, AA029379, AI272795, AW276106, AI049990,<br>AI679079, AA678767, AI863602, AW235480, AA610003,<br>AI307297, AI401790, AA426384, AW339352, AI832158,<br>W61155, AA299998, R50517, AI766939, AW237533,<br>AW292612, AI800262, R56910, AI480367, R62414, AI363258,<br>AI880530, AW237296, AA434297, N75586, F09963, R80409,<br>AW242309, AW051761, H84210, T81795, W61203, AI872364,<br>AA029378, AA121106, R62413, W07269, AI695106, T72570,<br>N79770, AI142598, AA910677, T82115, AF105365, and |

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| HWLAQ11 | 756 | 966207 | 1 - 554 | 15 - 568 | AL117433.   |
| HWLAL10 | 757 | 971666 | 1 - 438 | 15 - 452 | AI801975, AI698139, AI681600, and T24770.   |
| HWLAC70 | 758 | 775771 | 1 - 428 | 15 - 442 | AI453678.   |
|         |     |        |         |          | AI983434, AW341645, R86046, AI370387, AI582925, AA860287, AA931253, AW242845, AI355711, AI003805, AI674918, AI953136, AI439138, N30181, W74524, AI342466, N48608, AI203795, AA406573, AI916617, AI433905, AI590313, R77949, AI565402, AA411759, AW242806, AI918584, AI263073, and AI375289.   |
| HWLAC29 | 759 | 690263 | 1 - 363 | 15 - 377 | AI200957, AI371025, AI362183, AA765552, AW058085, AW134520, AI635734, R91403, H68404, AA648201, R02100, and AI494370.   |
| HWLAB74 | 760 | 765196 | 1 - 522 | 15 - 536 | H23551, AI376191, AI129920, AI424576, AA478517, H23995, H10292, H10851, and H10852.   |
| HWGQA42 | 761 | 713348 | 1 - 350 | 15 - 364 | H25446, and AC006353.   |
| HWGAG11 | 762 | 966623 | 1 - 747 | 15 - 761 | AI973037, AA760709, AW072412, AI969836, AI201581, AI824062, AA827147, W56389, W37398, AA490346, AI042370, AI221443, N98734, AW419070, AI216467, AW439942, AW206961, AI279656, AA643010, AI341522, AW073983, H83782, AA769021, AI202559, W31174, and H83925.   |
| HWCAD06 | 763 | 886808 | 1 - 689 | 15 - 703 | AL134524, AI393398, AI142134, AL038983, AL037727, AL045328, AL049018, AL039643, AL134110, AL038838, AL037343, AL037436, AL037335, AL037323, AL037443, AL038532, AL038822, AL039432, AL044125, AL041347, AL040193, AL037435, AL043923, AL043814, AL047012, AL044162, AL041238, AL044186, AL040617, AL043845, AL043496, AL045753, AL047163, AL040463, AL047170, AL044037, AL041635, AL040294, AL044064, AL041459, AL041577, AL038761, AL047219, AL040576, AL040625, AL043538, AL040621, AL045684, AL040472, AL041752, AL046850, AL040768, AL046994, AL046914, AL046442, AL040052, AL040444, AL040464, AL040510, AL043467, AL043677, AL040839, AL043492, AL041602, AL044074, AL041730, AL041523, AL043627, AL041374, AL047183, AL043848, AL043570, AL042135, AL041955, AL041324, |

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|         |     |        |          |           | AL041133, AL045671, AL039360, AL041098, AL045327, AL039316, AL040322, AL042898, AL046392, AL040119, AL044272, AI547295, AL044258, AL045990, AL042096, AL041168, AL041163, AL041159, AL037295, AL045920, AL040148, AL047057, AL041296, AL037341, AL040458, AL044187, AL038745, AL044274, AL041358, AL041086, AL041292, AL040571, AL041346, AL041142, AL040332, AW392670, AL039338, AL079878, AL040529, AL041233, AL041197, AL037279, AL046330, AL040745, AL040370, AL040128, AL040553, AL047036, AL040342, AL041186, AL040414, AL043941, Z99396, AW372827, AL038651, AL039744, D29033, AL041277, AL040285, ALI19324, AL040155, AL040091, AL044165, AL041131, AL040090, AL079852, AL048677, AL041051, AL040168, AL038878, AL043775, AL040253, AL045857, AL038837, AI318479, AL037051, AL036725, AL036418, AA631969, AL039074, AL045817, U46347, U46344, AL039085, AL039564, AL036858, AL039156, AL039108, AL038509, AL039109, AL039128, AL036924, AW384394, AW363220, ALI19484, AL037094, AL048714, AL039659, ALI35012, AL038531, AL036196, ALI19443, AW363350, AL039625, AL039648, AL048657, AL045337, AL036767, AL038024, ALI19457, AL037082, AL043003, AL037526, AL036190, AL038447, ALI19497, AL037639, ALI19319, AL039678, AL039629, AL039423, AL041344, AL036238, AL039150, ALI19439, AL045494, ALI19391, U46350, AL040992, U46351, AL042909, ALI19522, AL042523, AL038520, ALI19483, ALI19363, ALI19418, ALI19355, AL037077, U46341, U46349, ALI19341, ALI19396, AL037726, AR066494, AR064707, AR023813, AJ238010, AR060234, D17247, A93923, A93916, A81671, AR069079, A93931, A85203, AB026436, AR054110, ALI33053, ALI22101, ALI33074, and ALI33049. |
| HVATY05 | 764 | 928713 | 1 - 671  | 15 - 685  | AA989233, AA854059, N63233, AI524313, AA582145, N64281, AW450116, AA758375, AI863818, N79002, and AA719684.   |
| HVASJ79 | 765 | 951617 | 1 - 1632 | 15 - 1646 | AA873275, AI830154, AI079818, AI361958, AW302989,   |

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|         |     |        |         |          |  | AW268779, AA653972, W22172, AA502940, AA554515, AI492218, AW304606, AI743201, AI198344, W87734, AI041005, AA369185, W87696, W87733, AI085432, AI051262, AW044590, AW051567, AI089831, T48516, AA780298, AA235536, AA410617, AI821566, AW149849, AI677815, AI687568, AW059713, AI370322, AI440444, AW409874, AI654135, AL117585, A51774, AF081571, AF114818, X56530, AL133081, U68233, I92592, D25291, X95876, AL133077, AL022165, AF043345, L10613, and D82790.   |
| HVAPI01 | 766 | 913930 | 1 - 759 | 15 - 773 |  | AI347604.   |
| HVAET01 | 767 | 913958 | 1 - 426 | 15 - 440 |  | AI299187, and AL133243.   |
| HVAEP04 | 768 | 925914 | 1 - 290 | 15 - 304 |  | AI811989, AI570961, Z99396, AW392670, AW363220, AW384394, AW372827, AL119443, AL134902, U46349, AL119396, AL119341, AL042965, AL119497, AL119319, AL134527, AL119457, AL119483, AL119324, AL134518, U46351, AL119484, AL119363, AL119391, AL119355, U46350, AL134920, AL119399, AL134533, AL134528, AL134538, AL134524, AL119335, U46341, U46346, U46347, AL134536, AL119444, AL119522, AL037205, AL134529, AL119439, AL042433, AL119418, AL080317, AR060234, AR066494, A81671, AR069079, AR054110, and AB026436. |
| HVACY04 | 769 | 926473 | 1 - 449 | 15 - 463 |  | H05055, T63507, and AI611300.   |
| HUTSF11 | 770 | 966029 | 1 - 416 | 15 - 430 |  | AI384010, AI288640, Z20435, and A74523.   |
| HUTAF08 | 771 | 958353 | 1 - 467 | 15 - 481 |  | AA977579, AA421364, AA815356, and H95526.   |
| HUFGC48 | 772 | 950707 | 1 - 429 | 15 - 443 |  | AA458691, AW242885, and AC004988.   |
| HUFFW06 | 773 | 934895 | 1 - 568 | 15 - 582 |  | AA027335, AA081555, AI872625, AI799533, AC005050, AL096791, AC004755, AC002425, AC002470, AC007308, AF053356, AC007207, AC005015, Z85996, AJ011930, AC007993, AC016025, AC004019, and AC005520.   |
| HUFFC02 | 774 | 969054 | 1 - 367 | 15 - 381 |  | AA065154, AA065155, AI183935, AW301116, AW057873, AA403324, AF147446, and D80010.   |
| HUFDO11 | 775 | 966407 | 1 - 404 | 15 - 418 |  | W03945, AI884522, AI355246, AI041375, F35684, R67701, AA834816, AW089016, AI573009, AI039257, AI801649, AW021674, AA338238, AA126969, AA809546, AA582746, T57096, AI445373, AW242031, AI804539, AA568204,   |

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| AA570740, AA483606, AW302670, R64640, AA338237, AI797998, AI275183, AI608751, AI679759, AA451682, AI300818, AI310992, AA228778, AA728911, AI445699, AW439893, AA807704, T51436, AA460714, AW008217, AI613389, AA526643, AA084148, AI268818, AW117704, C14698, AA595661, AI280504, AC006468, AC007731, AC005500, AC005183, Z97054, AC005531, AD000092, AC004552, AC004223, AC004832, AC004491, AC005323, AC002477, AC006597, AL035587, AC005300, AF139813, AF165926, AC004967, AC005015, Z93930, AP000553, AC002544, U80017, AC005529, AC000353, AL117337, AL109758, AC002472, AF196972, Z97630, AF001549, AL135960, AJ131016, AL008719, AC006449, Z95113, AC004033, AC005844, I34294, AL080243, AC002400, AC005602, AC005412, AC006512, Z95115, AC003007, AP000555, AL121655, AC006040, AF196969, AC004966, AC003071, AL080317, AC008009, AC005288, AF205588, Z98052, AC005632, AL031659, AP000211, AP000133, AC005924, AC006509, AC005031, Z95704, AC005482, Z68276, AC005102, AL031282, Z97056, AC004049, AC007011, AF111168, AF045555, AL109628, AC007226, AL049569, AC004531, AP000501, AL136295, AL021546, AC004707, AC005821, AC005206, AL034379, AL020997, AC004796, AC006014, AC004024, AL133355, AL024498, AC000025, AC003665, AC002551, AL049776, AC002312, AC005488, AL139054, AC005800, AL035071, AC008044, AC007055, AC005618, AC005667, AL049539, AC006165, AC002425, AL035659, AL031005, AC004854, AC005972, AB023049, AC005829, AL050321, AP000356, AP000348, AC005387, AL096791, AC005261, AP000247, AF064861, AF196970, AC004659, AC001231, M63543, AC007637, AC004150, AL034549, AC002300, U91323, AC004987, AC005484, AJ229041, AC006241, Z83844, AC003009, AC002558, AL109984, AL135744, AC005229, AC003108, AF001550, AC005726, AL096701, AL135783, AL035458, AL049758, |  |  |  |  |  |
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|         |     |        |         |          | AL050341, AL049872, AC008132, AC007537, AC002310, AP000512, M63544, AB023048, AL035658, AC004383, AC004999, AF038458, U47924, Z93017, AC006057, AC004633, AC004895, AP000117, AC007981, AC002045, AC004876, AC006450, AC006160, AC007225, AL133163, AB026898, AC005280, AF053356, AC006285, AC007216, AC004812, AC007774, AL121658, AC004125, AC004167, Z98044, AF111169, AC007151, Z98949, AC006443, AC000159, AC007386, AL022318, AC016025, AC007421, U85195, AL121652, AC005527, AL050318, AC005391, U95742, AL031767, U91326, AC004638, AC002565, AC006026, AF030453, AC004228, AL031432, AL035400, AE000658, AC004000, AP000112, AC007285, AC009247, AC007050, AC004099, AC005231, AL117258, AC006162, Z85986, AC005089, AC004914, AC007283, AP000689, AC004953, AL049869, AC005081, AC016831, AC002299, AC005520, AC005785, AC004584, AC005874, AF134471, AL035652, AL034420, AC006947, AC005562, AP000513, Z84480, Z83838, AL034429, U95740, AC003025, AF196971, AC007766, and AC006388. |
| HUFDN22 | 776 | 783765 | 1 - 430 | 15 - 444 | AA233997, AL135608, AA157308, AI934999, D81149, D60727, AI969520, H23082, W22896, F07060, AA299769, AI749069, AI829619, AW006228, AA299827, AI354690, AA773322, AA480943, AI494218, AA643671, AI343102, and AF071172.   |
| HUFDH29 | 777 | 689979 | 1 - 707 | 15 - 721 | H14683, R56199, AI686422, T74277, F12415, T68970, R12972, Z42675, and AB023201.   |
| HUFDH03 | 778 | 923561 | 1 - 531 | 15 - 545 | N31538, N31041, and N44826.   |
| HUFCO89 | 779 | 786817 | 1 - 299 | 15 - 313 |   |
| HUFCO04 | 780 | 731462 | 1 - 358 | 15 - 372 | AA743394.   |
| HUFCI80 | 781 | 773161 | 1 - 808 | 15 - 822 | AA075994, W63643, AA043571, AW376194, AA348642, AA578387, H10706, AA081648, AA852140, AA332535, D82793, N56274, AA384733, T27278, AA057498, AA094783, Z19471, AA174144, AA305150, AC005838, AF151906, U91322, AC003065, AC005033, AC006543, AC006544, and AR019365.   |
| HUFBP22 | 782 | 582067 | 1 - 496 | 15 - 510 | U86136.   |

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| HUFBD16 | 783 | 661856 | 1 - 452 | 15 - 466 | H79879, R97868, AC006312, AL109628, AC007731, AC005500, AF205588, AF139813, AC004228, AL031311, AF001549, AL121603, AL050338, AL049776, AC005261, AF003529, AP000512, AC005562, AC002377, AB023051, AC007298, AL050348, AC005971, AC006241, AC004694, AC006130, AC009247, AC007011, AC004834, AC005529, AC007225, AC004994, AF196779, AL021393, AL049643, AC005527, AC005399, AC007308, M89651, AC004938, AC006511, AC006084, U47924, AC005015, AC005207, AL096701, Z93023, AC004019, AC006515, AC002470, AF111167, AC006211, AC004081, Z84484, AC004832, AC005531, AC004686, AL035420, AL132777, AC003071, AC002400, AC005695, AC006017, AC005274, AC005519, AC004975, AL031680, AC004000, AL022476, AC006512, AL031848, AC008044, AC002091, AL034379, AC004820, AL035685, AC003098, AL121825, AC006077, AL133485, AL139054, AC003029, AL031575, AC007686, AC004922, AC004531, AC007450, AC005089, and AP000503. |
| HUFAU90 | 784 | 787302 | 1 - 477 | 15 - 491 | N47541, and AL122084.   |
| HUFAO77 | 785 | 772133 | 1 - 288 | 15 - 302 | H10059, and AC004016.   |
| HUFAO24 | 786 | 467860 | 1 - 576 | 15 - 590 | W48600, and AL117454.   |
| HUFAJ16 | 787 | 621443 | 1 - 743 | 15 - 757 | AI538273, AI027279, H92221, AA806405, AI061158, AA225519, AA505108, AI446618, AA765899, AI884404, C18748, H86399, AI567676, AW022796, C75332, AI571094, AI801479, AA364082, AW157128, AW028376, AI554399, AI031759, AI281622, H53546, AI805699, AI570067, AI000314, AI434103, AA873661, AW029626, R79396, AI798521, AI038029, AW085626, AA772818, H47461, AI860648, AI251024, AA809104, AI821945, AW338633, AI307563, N72678, AI708565, AI921744, AA569220, AA635150, AA411337, AW104040, AA349923, H24331, AA171400, H05066, AA935827, AA218684, AI888050, AA084320, F31670, AA604601, AI869886, AI890283, R61887, AI174703, AA714190, AI114755, AA143703, AI572680, AA293809, AA083850, AL041375, AA084148, AA618531, AW148974, AA152398,   |

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| HUFAG52 | 788 | 727087 | 1 - 307 | 15 - 321 | AW291225, AL261702, R38814, AI186145, AA905337, AA863136, AI221372, AI271720, AI279205, AA894648, H88964, D61989, AA251615, and AF070595.   |
| HUFAB12 | 789 | 970725 | 1 - 589 | 15 - 603 | AI738566, AI278276, AI493198, AI198274, AI143511, and N26559.   |
| HTPHG02 | 790 | 918237 | 1 - 896 | 15 - 910 | AA203149, R00127, and AL044506.   |

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|---------|-----|--------|----------|-----------|---|
| HTPFS02 | 791 | 918251 | 1 - 277  | 15 - 291  | T61298, and AL049839.   |
| HTPFF82 | 792 | 869864 | 1 - 448  | 15 - 462  |   |
| HTPFF81 | 793 | 869862 | 1 - 369  | 15 - 383  |   |
| HTPEI73 | 794 | 465462 | 1 - 317  | 15 - 331  | AA279040.   |
| HTPDZ79 | 795 | 968067 | 1 - 1222 | 15 - 1236 | F12986, H53276, AA037611, T75365, T75366, F12985, R34645, AA249802, AI989482, and AW296784.   |
| HTPDV49 | 796 | 931787 | 1 - 2594 | 15 - 2608 | AC003031.   |
| HTPDA96 | 797 | 796101 | 1 - 457  | 15 - 471  | AW006814, AW003336, N48824, and AW136088.   |
| HTPCZ41 | 798 | 576943 | 1 - 756  | 15 - 770  | AI732452, AA088857, AI732595, AW351701, AI424922, AA132858, AW375352, AA149682, AI733889, AA132946, AI420906, and AW362901.   |
| HTPCV43 | 799 | 459467 | 1 - 447  | 15 - 461  | H27024, AI128444, and AI346860.   |
| HTPCS79 | 800 | 835550 | 1 - 376  | 15 - 390  | H38451, H52133, R87761, R87771, AI922949, AI922958, AI972432, AI961967, AA568658, AW009248, H18285, H43455, H61275, and AL022328.   |
| HTPCR30 | 801 | 574757 | 1 - 359  | 15 - 373  | AA604872, H49701, and AC004087.   |
| HTPCE41 | 802 | 712642 | 1 - 498  | 15 - 512  | AA259015.   |
| HTPBX04 | 803 | 927828 | 1 - 471  | 15 - 485  | R56356, and Z45031.   |
| HTPBU39 | 804 | 530441 | 1 - 162  | 15 - 176  |   |
| HTPBU35 | 805 | 530440 | 1 - 352  | 15 - 366  | AI870357, AI935062, AI285992, AA251405, AA287379, AA826944, AA621133, AI831481, AI244734, AA806652, AW103288, W73663, AW182748, AI244664, AA436810, AI422961, AI246681, AA701034, AA969674, and AF109377. |
| HTPBD55 | 806 | 754147 | 1 - 306  | 15 - 320  | AA135370, W84729, AA295630, and R01600.   |
| HTPAT20 | 807 | 668771 | 1 - 388  | 15 - 402  | T54340, AA295321, AI133289, and AB007895.   |
| HTPAP93 | 808 | 791415 | 1 - 220  | 15 - 234  | T39933, and AA295307.   |
| HTPAO01 | 809 | 961062 | 1 - 590  | 15 - 604  | AI949455, AW303582, AI223408, AA625586, AA416613, AI016819, AA416708, AI192010, AI126130, AI139838, AA295198, and H88336.   |
| HTPAI20 | 810 | 937644 | 1 - 406  | 15 - 420  | AA294985, and AI380819.   |
| HTPAG06 | 811 | 960784 | 1 - 557  | 15 - 571  | AA456950, and AA386216.   |
| HTPAE77 | 812 | 772737 | 1 - 520  | 15 - 534  | AA075738, and AA386160.   |
| HTNTA60 | 813 | 840258 | 1 - 498  | 15 - 512  | AA158012, and AA158013.   |
| HTNGF71 | 814 | 870037 | 1 - 356  | 15 - 370  | AI922002, AA084725, AA189117, T90474, AL022313,   |

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|---------|-----|--------|---------|----------|--|---|
|         |     |        |         |          |  | AC004983, AC005529, Z78978, Y18000, AP000065, AL021392, AC005779, AC005694, AL022238, AC008101, AC004974, AJ010598, AC005756, AC008079, AC006501, AC004386, AC004686, AC001231, AF222684, AC004909, AC004217, AC004675, AL032821, and AF053356. |
| HSPMF55 | 815 | 871310 | 1 - 259 | 15 - 273 |  | N53881.   |
| HSPMF20 | 816 | 575826 | 1 - 89  | 15 - 103 |  |   |
| HSPBD58 | 817 | 735472 | 1 - 513 | 15 - 527 |  | AI819387, AW088020, and N23867.   |
| HSPBC71 | 818 | 759886 | 1 - 969 | 15 - 983 |  | N67323, AW080010, H88870, H88869, R67715, R99014, H88812, AI467915, AI038309, and AI039030.   |
| HSPAY58 | 819 | 964178 | 1 - 522 | 15 - 536 |  | AW269831, AA978290, H55860, H55768, C17251, AA236378, and AL035249.   |
| HSPA156 | 820 | 582583 | 1 - 425 | 15 - 439 |  | R23560, and AC004099.   |
| HSPA152 | 821 | 727212 | 1 - 383 | 15 - 397 |  | R13857, and AB023157.   |
| HSPAB58 | 822 | 736098 | 1 - 347 | 15 - 361 |  | AI718112, AA702244, and H64345.   |
| HSODZ52 | 823 | 825096 | 1 - 290 | 15 - 304 |  | H79244.   |
| HSODZ07 | 824 | 955932 | 1 - 493 | 15 - 507 |  | AA157075, AW188258, AA931237, AI270586, AA133526, AA594603, and AA133527.   |
| HSODV84 | 825 | 782529 | 1 - 687 | 15 - 701 |  | AA053854, W96253, and AA017300.   |
| HSODU86 | 826 | 784754 | 1 - 482 | 15 - 496 |  | AI968592, N67733, N28526, and W03579.   |
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| HSODR06 | 828 | 934645 | 1 - 610 | 15 - 624 |  | AA181481, and AA179806.   |
| HSODK89 | 829 | 786581 | 1 - 415 | 15 - 429 |  | R24235.   |
| HSODH33 | 830 | 701833 | 1 - 617 | 15 - 631 |  | N77561, and AI992358.   |
| HSODE10 | 831 | 963727 | 1 - 636 | 15 - 650 |  | AA234172, AA687622, AI015113, AA716277, AI803384, AW022936, AI769040, and AW023108.   |
| HSODD28 | 832 | 685884 | 1 - 602 | 15 - 616 |  | H12860, and AI457605.   |
| HSOBR45 | 833 | 717282 | 1 - 611 | 15 - 625 |  | W92082.   |
| HSOBP04 | 834 | 871340 | 1 - 421 | 15 - 435 |  | AA806268, and AA115758.   |
| HSOBO01 | 835 | 882825 | 1 - 316 | 15 - 330 |  | H55784.   |
| HSOBN03 | 836 | 923315 | 1 - 658 | 15 - 672 |  | AI084492, and AA449407.   |
| HSOBM53 | 837 | 727811 | 1 - 453 | 15 - 467 |  | W87318, and AL022725.   |
| HSOBK75 | 838 | 766940 | 1 - 576 | 15 - 590 |  | N56958.   |
| HSOBI75 | 839 | 766949 | 1 - 422 | 15 - 436 |  | H00767, AI971202, C20774, and AJ006945.   |

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|---------|-----|--------|---------|----------|---|
| HSOBH84 | 840 | 782118 | 1 - 320 | 15 - 334 | H30159.   |
| HSOBF30 | 841 | 691440 | 1 - 540 | 15 - 554 | N21031, AI476774, AI095242, AI690069, AI735444, AI591041, AI129276, AI219905, N81051, AW236759, AI148241, AI689543, AI867483, AA815339, and AA653637. |
| HSOBE61 | 842 | 908598 | 1 - 479 | 15 - 493 | AI280287, AA309966, and AC012627.   |
| HSOBE03 | 843 | 923322 | 1 - 373 | 15 - 387 | AI681558, AI871606, AA411144, AI732390, AA493545, AA578271, AA551639, AA507763, and AI702844.   |
| HSOBC07 | 844 | 952409 | 1 - 603 | 15 - 617 | AA776312.   |
| HSOBB11 | 845 | 966281 | 1 - 213 | 15 - 227 | AI391598, AL037447, and W03972.   |
| HSOAV63 | 846 | 745328 | 1 - 336 | 15 - 350 | T99715, and T67265.   |
| HSOAV11 | 847 | 967590 | 1 - 502 | 15 - 516 | AI681455.   |
| HSOAO64 | 848 | 746993 | 1 - 320 | 15 - 334 | AA947294, AA579887, AW195781, R63652, and AL049610.   |
| HSOAM10 | 849 | 968316 | 1 - 357 | 15 - 371 | AA186347.   |
| HSOAM07 | 850 | 953954 | 1 - 373 | 15 - 387 | AI017267, and AI719772.   |
| HSOAI35 | 851 | 537540 | 1 - 414 | 15 - 428 | R40859, AA995479, AL048244, AL048243, AC006599, and AB018333.   |
| HSOAG31 | 852 | 698357 | 1 - 294 | 15 - 308 | N53108, and AFI79633.   |
| HSOAF76 | 853 | 877300 | 1 - 314 | 15 - 328 | AA002207, R73816, R73841, T94384, AA225376, AA226684, AA225124, and AA225347.   |
| HSIGL32 | 854 | 698756 | 1 - 194 | 15 - 208 | T76945, R20210, and AC002996.   |
| HSIGK77 | 855 | 771815 | 1 - 462 | 15 - 476 | T71734, H90094, and H90004.   |
| HSIGK64 | 856 | 746241 | 1 - 408 | 15 - 422 | R25019, and R13488.   |
| HSIGJ94 | 857 | 793624 | 1 - 643 | 15 - 657 | AI984175, AA171807, AA262226, and AA127254.   |
| HSIGG54 | 858 | 887545 | 1 - 449 | 15 - 463 | AF015416.   |
| HSIGG42 | 859 | 713339 | 1 - 382 | 15 - 396 | H30811.   |
| HSIGF42 | 860 | 866561 | 1 - 495 | 15 - 509 | Z42388.   |
| HSIGD15 | 861 | 659718 | 1 - 458 | 15 - 472 | T88827, AI248440, R10334, and AC005534.   |
| HSIGA25 | 862 | 677668 | 1 - 526 | 15 - 540 | AA428755, and AI245055.   |
| HSIFZ27 | 863 | 682580 | 1 - 252 | 15 - 266 | H68353.   |
| HSIFY57 | 864 | 734373 | 1 - 929 | 15 - 943 | R34025, H06626, and AI536612.   |
| HSIFV93 | 865 | 792005 | 1 - 516 | 15 - 530 | N34941.   |
| HSIFV59 | 866 | 786436 | 1 - 475 | 15 - 489 | T57378, and AF072825.   |
| HSIFR52 | 867 | 726370 | 1 - 510 | 15 - 524 | NS0768, and AA210990.   |
| HSIFL30 | 868 | 691630 | 1 - 339 | 15 - 353 | H90238, and U51561.   |

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|---------|-----|--------|---------|----------|---|
| HSIFK84 | 869 | 782810 | 1 - 544 | 15 - 558 | W21172, AI298234, AA019846, C15076, D59317, D80164, D59551, D59695, D59627, AI535686, D59503, D59502, Z21582, AA305409, Z30160, AA305578, D52291, D59275, AI535665, D31458, AI525923, AI525925, AF050070, AF050079, U19859, AF050069, AR060385, AB002449, A82595, I79511, A84916, AB028859, and AJI32110. |
| HSIFH19 | 870 | 668188 | 1 - 425 | 15 - 439 | N94164.   |
| HSIFD30 | 871 | 691636 | 1 - 442 | 15 - 456 | AA116123, AA455933, AI277496, AW173279, AA479355, AA766385, H89964, AI807026, AA962459, AW270945, M85836, and AW138978.   |
| HSIED64 | 872 | 747012 | 1 - 528 | 15 - 542 | AA024953, AI130858, and AW024581.   |
| HSIED52 | 873 | 726017 | 1 - 546 | 15 - 560 | AA010315, AA887112, AI278227, AA010314, AI143410, AA040265, AW204117, AA694360, AI760943, and AI375956.   |
| HSIEA68 | 874 | 753612 | 1 - 587 | 15 - 601 | AA005148, R10757, and AC005940.   |
| HSIDZ18 | 875 | 666892 | 1 - 282 | 15 - 296 | AA133985.   |
| HSIDU10 | 876 | 866596 | 1 - 881 | 15 - 895 |   |
| HSIDS63 | 877 | 745340 | 1 - 309 | 15 - 323 | T73745, AW016390, AI471124, T73755, AI419108, AW026357, AI419596, and AI366515.   |
| HSIDQ95 | 878 | 795033 | 1 - 480 | 15 - 494 | W73818, W73851, R08292, and AI347540.   |
| HSIDH25 | 879 | 679296 | 1 - 396 | 15 - 410 | R15266, AL047469, and R05647.   |
| HSIDD63 | 880 | 559788 | 1 - 548 | 15 - 562 | T47922, AI671768, AW207720, AA701250, AW271763, AA702739, AI985183, H66133, H66549, W73428, AW372345, W69666, AW294792, AW292636, R19745, AI081094, AW292633, AI478491, W73367, AW089880, R84393, AA976621, AA704633, and AC020663.   |
| HSIDC85 | 881 | 783403 | 1 - 605 | 15 - 619 | W78843, and AL109659.   |
| HSIDB51 | 882 | 725888 | 1 - 443 | 15 - 457 | T83064, AC002094, Z69908, AC002324, and AB011096.   |
| HSIDA48 | 883 | 721885 | 1 - 157 | 15 - 171 | T66036, T65877, and AC004099.   |
| HSICV38 | 884 | 827957 | 1 - 559 | 15 - 573 | AA425507.   |
| HSICU58 | 885 | 507172 | 1 - 349 | 15 - 363 | AL078644.   |
| HSICQ22 | 886 | 675004 | 1 - 478 | 15 - 492 | T77227, AW058031, T99440, AA373896, T82852, N27680, AA533883, AA057865, AA121653, AA056931, and AI041059.   |
| HSICP86 | 887 | 785733 | 1 - 325 | 15 - 339 | T81910, and T91158.   |
| HSICP22 | 888 | 586284 | 1 - 313 | 15 - 327 | AW062662, AW177873, AW178142, AW178143, AW178141,   |

|         |     |        |         |          |   |
|---------|-----|--------|---------|----------|---|
| HSIBB22 | 889 | 518673 | 1 - 276 | 15 - 290 | <p>AW178144, AW177807, AW177808, AW062663, AW062664, AW178173, AW178226, AW178225, AW062666, AW178146, AW178110, AC005041, and AC006544.</p> <p>AA298647, AA377325, AA338289, AI276360, AA558404, AA456149, AW023111, AI358712, AW265126, AA610255, T06805, AW265688, AI310464, AA533054, AI590442, AI053673, AI572680, AA298573, F31654, AI249365, F26072, T50490, F31951, AI820534, AI821382, AI628859, AI587467, AA523695, AA180775, AA483483, AI870453, R93919, AA482928, AA502110, AW150387, AI583532, R91030, AI287921, AI769271, AC004832, AL117337, AL135960, AJ131016, AC007676, AC004967, AL133245, D00591, AF205588, AC004883, AC005288, AC005399, Z84487, AC005102, Z85986, AL020997, AC007055, AL050341, AC007684, AC006344, U91323, AL034418, AL035457, AP000556, AP000347, AC004112, AC005538, AC003963, AC005516, AC006120, AC007731, AL139054, AC005500, AC004531, AC000091, AC006057, AL031178, AC007690, AF053356, Z98884, AC002316, AC005839, AC002492, AF165926, AC005180, AL133448, AL109628, AC005484, AL078581, AC022517, AC004019, AC004983, AF111168, AP000355, AP000087, AC007052, AF129756, AP000272, AL121655, AL022476, AC006001, AC005619, AC005914, AC006050, AD000091, AC005358, AL133163, AB017602, AL022320, AC005015, AC004559, Z95115, AP000226, AC004084, AC006146, AP001068, AP000104, AL096791, AC003043, AL049776, AC003101, AC007899, AJ011930, AL049694, AC005921, AC005280, AC005837, AC007201, AP000688, AP000032, AC004991, AC005229, AB003151, AL032821, AC005225, Z97632, AF067844, AC003007, AF196779, AC007226, AC005081, AL034429, AF107258, AC005777, AC002544, AC007537, AC004647, AP000692, AC005013, Z98941, AL021918, U85195, AP000031, AC007566, AL109865, AC005274, AB023048, AC007065, AC006312, AP000343, AC006285, AL031846, AC004706, AL135744,</p> |
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| HSIAQ22 | 890 | 505052 | 1 - 351 | 15 - 365 | AL118900, AP000535, AP000079, Z81144, Z98751, AC000003, AC004033, AC007536, and AL035072.   |
| HSIAL16 | 891 | 496026 | 1 - 660 | 15 - 674 | R07186, AA563825, R07178, F35011, AL048969, AA601230, AI144081, AW302711, AA127426, AI753092, AW302753, AW085751, AA169245, AA515048, AA679625, AA501906, AI675615, AW301906, AI282253, AA693366, AI049709, AW338021, AI053560, AI133727, AA015948, AA654484, AW268300, AA719732, AP000501, AP000240, AC004884, AC004832, AC005280, AC007298, AP000030, Z84469, AC005089, AL022323, Z97053, AC004167, AC007226, AC000353, AC004963, AP000502, AC000025, AF111168, AC007371, AL080243, AL022302, AF190465, L44140, AL132712, AF196779, AC005412, AC005409, AL049874, AC005088, AC003072, AC006449, AL020997, AL121655, AC007421, AC002073, AB001523, AC005971, AC005081,   |

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| HSIAI62 | 892 | 522231 | 1 - 354 | 15 - 368 |  |   |
| HSIAI37 | 893 | 698015 | 1 - 61  | 15 - 75  |  |   |
| HSIAI03 | 894 | 960907 | 1 - 720 | 15 - 734 |  | AI346656, AI346667, and AI380663.   |
| HSIAD11 | 895 | 964915 | 1 - 424 | 15 - 438 |  | AA376854, and H02592.   |
| HSIAB63 | 896 | 745637 | 1 - 523 | 15 - 537 |  | AA196018, AA775199, AA706922, AI798729, AA132243, AA132242, AA192334, AA973154, AA376742, and AL049709.   |
| HSIAB05 | 897 | 932922 | 1 - 497 | 15 - 511 |  | AA127651, and AA376726.   |
| HSGBB01 | 898 | 916772 | 1 - 410 | 15 - 424 |  | AA781220, AA599070, AL079303, and U59628.   |
| HSGAA12 | 899 | 971541 | 1 - 418 | 15 - 432 |  | AA236764, and AA376628.   |
| HRTAR64 | 900 | 575020 | 1 - 363 | 15 - 377 |  | H45355, H49666, AA372974, N70354, AI909890, AA442334, R89350, AW062319, and N55639.   |
| HRTAR31 | 901 | 698417 | 1 - 336 | 15 - 350 |  | AA372947, N44034, and Z96074.   |
| HRTAP73 | 902 | 560932 | 1 - 589 | 15 - 603 |  |   |
| HRTAN72 | 903 | 766328 | 1 - 247 | 15 - 261 |  | AA372711, AA372710, AIS24360, AA603323, AL037910, AW377756, AA508478, AA584125, AA878149, W42588, AA339692, AI953764, AL038533, AA228349, AI818770, AA094320, AA371620, AA664320, AI637960, AA321392, AA829154, AA828739, N84446, N94011, AW076090, AF109907, AL050331, AC006559, AC005844, AL035467, AF049895, AL050348, AL031289, AL023799, AC004525, AC000052, AL117258, Z95114, U73169, AC006064, AC005690, AC004612, AF069291, AC005189, AC004702, AB020866, AL121694, AC006449, AC007077, AC005632, AL096712, AC004558, AC004983, U91326, AF001550, AF134726, AB023050, AP000547, AC005726, AC005293, Z97184, AC006167, AP000502, AC004812, Z98949, AC005669, AP000511, AC005479, AL049589, AC002544, AD000092, AC006251, AC003101, AC007687, AP000235, AP000148, AC004783, AL049694, AC004590, AL133245, AC004813, AC009514, AJ133269, AC005209, AL031274, AL021578, U95742, |

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|          |     |        |         |          |  | AC004821, S56773, AC004078, Z98051, AC004880, AC004230, AL050402, AL110502, U91321, AP000884, and AC007216.   |
| HRTAN70  | 904 | 524889 | 1 - 263 | 15 - 277 |  | AA372707.   |
| HRTAN65  | 905 | 753913 | 1 - 467 | 15 - 481 |  | W02953, AA372702, AA059274, Z44368, and AA527005.   |
| HRTAN23  | 906 | 675124 | 1 - 273 | 15 - 287 |  | AA372600, H57420, and Z69922.   |
| HRTAE57  | 907 | 871385 | 1 - 479 | 15 - 493 |  | T84441, T87483, H10262, T87081, AA227870, AI142241, AI142239, AI142363, R34809, W31798, AA056667, AA131958, Z44312, W19601, N73145, W95957, W95790, AA076461, AA372457, T30672, AA172239, AI207438, T34511, N45246, W23814, Z44333, AA044187, AA151085, AW362870, AF201947, and AF082526.   |
| HRTAD37  | 908 | 708782 | 1 - 410 | 15 - 424 |  | AI033098, N51040, AA248728, and AA372391.   |
| HROEA53  | 909 | 838825 | 1 - 625 | 15 - 639 |  | H16090.   |
| HROEA06  | 910 | 934673 | 1 - 784 | 15 - 798 |  | H16700, R36273, AA001525, R35323, and AA021271.   |
| HRODY95  | 911 | 838830 | 1 - 420 | 15 - 434 |  | R28414, AB018308, and AL109827.   |
| HRODX43  | 912 | 949765 | 1 - 344 | 15 - 358 |  | N53877, AA922057, AI554027, AA761896, AA765458, AA812026, AA422154, and Z73359.   |
| HRODU82  | 913 | 779482 | 1 - 895 | 15 - 909 |  | N39010, AA703251, AA610001, N49555, N52454, N48204, N70226, W01015, AA909680, R95730, N76638, N59801, AA620768, N72668, T60944, T72454, AI247967, W04253, N77417, N54558, R92250, R95729, N70306, H54267, H77986, H66295, R98125, T74769, H59752, H70786, H70192, H82996, H70787, N59393, T71408, N33572, H71414, H48399, R83198, H90106, N77081, T98185, R83197, T97622, H83075, H60121, H90016, N49312, H91229, H82855, R96821, R91926, T97574, H91175, H77987, H60122, H67721, H59753, N54243, T61011, R98821, H71415, N78259, H83229, H54268, AJ242928, and AB017551. |
| HRODE08  | 914 | 958532 | 1 - 604 | 15 - 618 |  | AW368057, AI692660, AA715719, and AI808462.   |
| HRODD02  | 915 | 918978 | 1 - 426 | 15 - 440 |  | R98174.   |
| HR OCC67 | 916 | 751223 | 1 - 705 | 15 - 719 |  | AI127460, AW419346, R80085, R53734, AI475201, AI373960, AA225023, AA169396, AI973283, and AL035400.   |
| HR OCC38 | 917 | 709348 | 1 - 279 | 15 - 293 |  | H67640.   |
| HR OCB26 | 918 | 812019 | 1 - 439 | 15 - 453 |  | AA039396, AI096343, AB022430, AF035448, and AF035408.   |

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| HROCA33 | 919 | 701847 | 1 - 427 | 15 - 441 | H84680.   |
| HROBZ37 | 920 | 708773 | 1 - 666 | 15 - 680 | R99605, R99710, R99682, R99576, and AC002073.   |
| HROBY02 | 921 | 918972 | 1 - 499 | 15 - 513 | AI871120, and AI391487.   |
| HROBW35 | 922 | 707622 | 1 - 660 | 15 - 674 | T83735.   |
| HROBU31 | 923 | 693831 | 1 - 591 | 15 - 605 | N38913, and AA505798.   |
| HROBU02 | 924 | 951649 | 1 - 385 | 15 - 399 | R07729, AA228880, H60779, H49171, H95212, H68371, AA203416, AW009618, AA296635, AA490628, and H61001.   |
| HROBR02 | 925 | 918985 | 1 - 508 | 15 - 522 | AW451235, AI694586, H30117, AW451997, AW452091, and Z58991.   |
| HROBL46 | 926 | 718638 | 1 - 458 | 15 - 472 | T90904.   |
| HROBH25 | 927 | 677574 | 1 - 560 | 15 - 574 | H39085, and AC006443.   |
| HROBG67 | 928 | 751230 | 1 - 374 | 15 - 388 | R09792.   |
| HROBF19 | 929 | 668013 | 1 - 447 | 15 - 461 | N29851.   |
| HROBD79 | 930 | 774558 | 1 - 643 | 15 - 657 | N69648, N72687, and H70701.   |
| HROAZ07 | 931 | 973603 | 1 - 502 | 15 - 516 |   |
| HROAW79 | 932 | 774604 | 1 - 447 | 15 - 461 | R22240.   |
| HROAV11 | 933 | 966329 | 1 - 321 | 15 - 335 | T86201, and T80955.   |
| HROAU03 | 934 | 923381 | 1 - 327 | 15 - 341 | AA455823.   |
| HROAS95 | 935 | 795621 | 1 - 627 | 15 - 641 | AA053433.   |
| HROAS28 | 936 | 685982 | 1 - 368 | 15 - 382 | T86999, T99364, AI536908, AA470779, N32944, AA113170, AA911448, AW301491, AI865309, AC004765, AL049278, and Z85986.   |
| HROAQ54 | 937 | 729168 | 1 - 396 | 15 - 410 | T98456.   |
| HROAL96 | 938 | 867080 | 1 - 673 | 15 - 687 | AI887748, AW168158, W45355, AW303882, AI805418, AW438620, R62625, AI859373, AI686763, AA724880, AA694428, AA994785, AI569360, H64285, AI689362, AI354846, AW167889, H38775, AA226178, AW189456, AA917499, AI538416, AI376429, AI459109, AA659415, AI364174, W15507, AI435013, W74197, AA284943, AA479784, AA844193, AI589336, AI539530, AW195028, W60989, R53803, AI262183, AA586992, AW130476, AA506665, AI631868, AA468260, R53814, R62615, AA226522, AI280811, H80729, T10601, W79840, AW378719, AW051240, AI915756, R30965, AA128014, AA128057, AL037910, AI918612, T81774, |

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| AI68606, AI000192, AI873854, AW021774, AA731723, AA181513, AA152416, AI591299, AI590522, AA994578, AI344810, AI916335, AA176836, AW302048, AL045077, AA523820, AA505070, AI525532, AA441878, AA446723, AI433247, AI284583, AI590459, AW339622, N22032, AW022317, AI075935, AI826845, AA125988, R02089, AW082744, AL021938, AC007051, Z85987, AF111168, AC004448, AP000557, AC005081, AC002400, AC006064, AC005015, AP000552, AC006312, AC005899, AC005747, AL022313, AL008582, AC002115, AL031005, AC005488, AL135744, AL049759, AC005740, AC003101, AC003029, AC004887, AC005520, AC002045, AC004843, AL109952, AC005527, Y10196, AC016025, U91326, AC005071, AC004067, AC008372, AP000514, AL035072, Z85986, AL031281, AL133163, AL031659, AL049776, AL096791, AC002996, AC004386, AF053356, AF117829, AL008729, AB023049, AL024498, AC006014, AL009181, AC004814, AF001549, AC005808, AC005911, AC004003, Z95116, AC007510, AL049869, AC004019, AL022320, AC006965, AC002039, AL031662, AL080243, AC002418, AC005839, AC006285, AF205588, AC004033, AC005529, AL022476, AC005923, AC002544, AC005971, AC004584, AC009516, AC006211, AC004890, AC005821, AC004000, AF196971, AC003043, AC005261, Z86090, AC005832, AL031120, AP000356, AC007021, AC005694, AC004531, Z83844, AF111169, Z82188, AC006017, AC002395, AC002316, AL031311, AC008018, AC003982, AC004257, AL035587, Z83843, AC002054, AC012627, AC005245, Z99716, AC004815, AC004148, AC004895, AL021808, AC007308, AF165142, AC005251, AC005358, AC005280, U95742, AL121653, AC003109, U52112, AC007216, AC005399, AL133245, Z84480, AC006241, AC007664, Z82214, AC007934, AL034429, AC005919, AC005519, AC005772, AL049780, AC006552, AC004675, AL035685, AL031289, AC005874, AL133448, AF134471, AC003682, AL117337, AC002073, AC005255, AL121658, |  |  |  |  |  |
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|         |     |        |         |          | AL109627, AC004805, AC007536, AL078477, AC007676, AC005921, AP000550, AC004125, AC003098, AC004990, AC005914, AC000052, AF088219, AL021937, AL096701, AC006077, AL031133, AC006486, AL049875, AL035530, AC005207, Z84469, AC004682, AF051976, AL109798, AC005049, AC005060, AC004938, AL050348, AC006530, AC003091, Z98051, Z93017, AL050308, AF129756, AP000692, AC011718, AC007226, AC005264, AL031767, AL009031, AF134726, L78810, AC007227, AF196969, AC005004, AC005837, AP000513, AL133243, AC004587, AL139054, AL031295, AC005695, AC005412, AC002090, AL035683, AC002326, AL035249, AC005670, Z97054, Z85996, AC005954, AC005822, AC005291, AF038458, AC004596, AC004821, AC004254, AC004858, AC006160, AC004797, AL109758, AC005180, AC005829, AC007358, AC007055, AL034549, AL023553, AC005332, AL008710, AC005722, AL009179, AC006130, AL050307, AP000553, L78833, AL050318, AL020993, AC007225, AB020866, Z98946, and AL132777. |
| HROAJ83 | 939 | 781394 | 1 - 466 | 15 - 480 | R92032, H57725, AI200922, and AI200919.   |
| HROAI61 | 940 | 742084 | 1 - 596 | 15 - 610 | AI769476, W77827, AW269989, AI339358, AI215593, AA973129, W72191, AW450132, N95340, AA247151, and W24962.   |
| HROAG39 | 941 | 526488 | 1 - 186 | 15 - 200 | AC005484, and AC004962.   |
| HROAF96 | 942 | 830769 | 1 - 446 | 15 - 460 | H05826, AI214244, AI088894, AI079203, AW055078, AA400706, Z40251, AA127228, W35112, H20787, H77308, AA004682, AA505056, W23679, AI423257, AI359089, AI863034, AI125459, AA991291, AA853910, AI253662, D20136, AA513204, AA507670, AI077992, W38818, and AF092132.   |
| HROAE84 | 943 | 881995 | 1 - 772 | 15 - 786 |   |
| HROAD39 | 944 | 597055 | 1 - 425 | 15 - 439 | R25632, and AC005375.   |
| HROAD06 | 945 | 954694 | 1 - 431 | 15 - 445 | R84228, and R96571.   |
| HPASF63 | 946 | 745524 | 1 - 434 | 15 - 448 | H52977.   |
| HPASE19 | 947 | 672016 | 1 - 304 | 15 - 318 | H10603.   |
| HOCNF65 | 948 | 859585 | 1 - 521 | 15 - 535 | H23470, AL041560, AI380171, AW297334, AW206916, AI421917, AA621171, AW296685, H47027, AI140475,   |

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|          |     |        |         |          |  | AI361272, AI652621, AW207643, Z38296, H46488, AL041559, H17831, and F01565.   |
| HNSMD08  | 949 | 958337 | 1 - 709 | 15 - 723 |  | N28216.   |
| HNSMC05  | 950 | 840216 | 1 - 646 | 15 - 660 |  | AA084461, AL042069, and AL110249.   |
| HNSAA51  | 951 | 971484 | 1 - 732 | 15 - 746 |  | AA976830, AI934102, AL119457, AL119324, AL042544, AL119399, Z99396, AL134524, AL119443, AW392670, AL036418, AL038837, AL037051, AL036725, AW372827, AL036858, AA631969, AW384394, AL119418, AL119484, AL039074, AL119319, AW363220, AL119522, AL119497, AL134902, AL119391, U46351, AL119464, U46350, AL036924, AL119355, AL119483, AL119363, AL037205, U46341, U46349, AL119341, AL038509, AL039564, AL119401, AL039085, AL119335, AL119396, AL039156, AL039108, AL039109, AL039128, AL119439, U46347, AL119496, AL037639, AL119444, AL134525, AL037094, AI142139, AL039659, AL043019, AI142137, AL036196, AL036190, AL134536, U46346, AL038531, AL037526, AL037085, AL037077, AI142131, AL036268, AL134526, AL042614, AL036767, AL037082, AL042984, AL042965, AL042975, AI142132, AL134538, AL039625, AL039648, U46345, AL038851, AL045337, AL036238, AL038520, AL039851, AL042551, AL042542, AL038447, AL039678, AL039629, AL042450, AL043029, AL039386, AL037615, AL043003, AB025008, AB025009, AR060234, AR066494, A81671, AR069079, AR023813, AR064707, AR043113, AB026436, and AR054110. |
| HNSCM03  | 952 | 922136 | 1 - 439 | 15 - 453 |  | AI263076, AW272255, AI792912, and AI734009.   |
| HNSKAZ51 | 953 | 947067 | 1 - 820 | 15 - 834 |  | Z99396, AL038837, AL037051, AL036725, AA631969, AL039074, AL036418, AL039085, AL036858, AL039564, AL039156, AL038509, AL039108, AL039109, AL039128, AL036924, AW392670, AL037094, AL039440, AL039659, AL038531, AL036196, AW372827, U46341, AL119497, AL039625, AL039648, AL045337, AL038447, AL036767, AW384394, AL037082, AL037526, AL036190, AL037639, AL039678, AW363220, AL039629, AL119457, AL119319, AL039423, AL036238, AL119363, AL039150, AL119391,   |

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|         |     |        |         |          | AL038520, AL040992, AL042909, AL119335, AL119443, AL037077, AL119496, U46350, AL119324, AL119484, AL119483, AL037726, AL119341, AL119355, U46346, AL119522, AL038851, U46349, AL039410, AL119396, U46351, AL036998, AL037615, AL037085, AL036733, AL039386, AL134528, AL036268, U46347, AL119418, AL119444, AL042614, AL042975, AL119439, AL037027, AL037178, AL134533, AL045353, AL037205, U46345, AL134518, AL134524, AL036765, AL036679, AL042965, AL119399, AL036973, AL036191, AL042984, AL042970, AL134531, AL142132, AL042551, AL134538, AL134542, AL042450, AL036719, AL119488, AL042544, AL043019, AL043029, AL037021, AL042542, AL043003, AL037054, AL036836, AL036158, AL119464, AL036774, AL036886, AL036999, AL036964, AR060234, AR066494, AR023813, A81671, AR064707, AR069079, AR054110, AB026436, and AR064706. |
| HNKAO08 | 954 | 955691 | 1 - 976 | 15 - 990 | AL1979261, AL423298, AI640707, AW341832, AI032611, AI818044, AI299508, AI911386, AI270418, N71836, N59447, AA826491, R54110, Z25159, Z39436, AA587421, T32982, F09044, AA769767, and AL031003.  |
| HNKAB83 | 955 | 914959 | 1 - 548 | 15 - 562 | AI566101, AA721082, H87850, AI949699, AI160614, AA417266, AW439812, AI093245, AA928184, AI695423, N29576, AI761215, AI720751, AI138449, AA514412, AA580190, AA825290, AI267574, AI701478, AI686337, Z39053, AI498485, AW193765, AA032214, AI186466, AW138685, AI026619, AI301500, AA876544, AW073960, D62736, AA602996, and AI422653.   |
| HNJDR12 | 956 | 968978 | 1 - 505 | 15 - 519 | AI085377, AI743872, AW170449, AI769100, AI080610, AI148232, AI472832, and AI086668.   |
| HNJCE58 | 957 | 927451 | 1 - 918 | 15 - 932 | AI128489, and AA058692.   |
| HNJBY05 | 958 | 928680 | 1 - 439 | 15 - 453 | T77126.   |
| HNALB40 | 959 | 507439 | 1 - 492 | 15 - 506 | T61125, AI357584, AI357594, AI370909, AI653509, AA740653, AI262181, AA932188, AW338203, AA287566, AW004871, AI932958, AA287565, AA939295, AA907858, C04769, AA759017, AA707452, C05477, F31371, and AI814938.   |

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|---------|-----|--------|---------|----------|---|
| HNALB10 | 960 | 968198 | 1 - 258 | 15 - 272 | AA443771, AI298995, AC006328, and AC005630.   |
| HNAAE09 | 961 | 888913 | 1 - 493 | 15 - 507 | Z99396, AW392670, AW384394, AW363220, AL119497, AW372827, AL036418, AL119443, AL038837, U46347, AL037051, AL036725, AA631969, AL119396, AL119391, AL119341, AL119319, AL119457, AL119324, U46341, AL119483, AL119484, AL119363, AL119355, AL119335, U46350, U46349, AL036858, AL119522, AL119496, U46351, AL039074, AL036924, AL042975, AL119399, AL119418, AL134902, U46346, AL119444, AL134533, AL134529, AL134527, AL042614, AL037205, AL119439, AL038509, AL039564, AL037085, AL043003, AL042965, U46345, AL134920, AL134528, AL037094, AL037526, AL042984, AL036196, AL119488, AL042551, AL036190, AL134536, AL134538, AL042433, AL037639, AL042970, AL038520, AL039659, AL042450, AL142134, AL036767, AL037082, AL036268, AL042542, AL042544, AL043019, AL043029, AL037077, AL036238, AL036998, AL036733, AL042909, AL038447, AL037027, AL119464, AL036774, AL037178, AL038851, AL037615, AL037021, AL036765, AL036719, AL036191, AL036679, AL039410, AL036886, AL031058, A81671, AR060234, AR066494, AR023813, AR069079, AR064707, AR054110, and AB026436. |
| HMZME85 | 962 | 861084 | 1 - 791 | 15 - 805 | AA582005, N31378, AL133058, AL137583, AF115389, AF089744, AF099082, AF131098, AF131100, AF198106, AF131097, AF198105, AF131099, AF131101, AF198104, AF131096, AF114753, and AF131102.   |
| HMZME57 | 963 | 734417 | 1 - 304 | 15 - 318 | T54435, and T54434.   |
| HMZMD49 | 964 | 722624 | 1 - 429 | 15 - 443 | AA046400, AI769960, H87413, AI458141, and AI743200.   |
| HMZAE53 | 965 | 868116 | 1 - 304 | 15 - 318 | AA167323, AA167320, AI821552, AI821518, AA167144, and AA167062.   |
| HMZAC09 | 966 | 625188 | 1 - 748 | 15 - 762 | AA446075, AA430264, AF127980, AF043977, and AB026833.   |
| HMZAA34 | 967 | 703755 | 1 - 614 | 15 - 628 | AL138057, R32100, H03041, AL046696, AI679639, and W23313.   |
| HLXNC18 | 968 | 973906 | 1 - 666 | 15 - 680 |   |
| HLXNB04 | 969 | 926933 | 1 - 442 | 15 - 456 | W01053, R83641, R98509, and AF120999.   |



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|---------|-----|--------|---------|----------|---|
| HLQIF28 | 970 | 856619 | 1 - 372 | 15 - 386 | T64673, T74667, T58830, AL121739, AB024079, AL021879, and AF104312.   |
| HLQHD03 | 971 | 856624 | 1 - 460 | 15 - 474 | AA402102, AA401945, AW193493, AA961197, AA384039, AA515435, AA640979, AW407919, T60699, F37223, AA737154, AL119123, AW371267, AA836811, AI648558, AI597832, AA557879, T47739, H85616, AA595669, AA354507, AW265654, AA548029, AA714595, AI580898, AI360514, AA515937, AA664604, AA747375, AA368329, AI633185, H86301, H86264, AA713715, AI038990, AI791189, AA468051, AI338509, AA831388, AI469624, AA805841, AA658937, AA467988, AA947370, AW243960, H58472, AF150152, AA010672, AI367721, AA326410, F31799, AA779783, AI928790, D58782, AA394271, AA632960, AA342901, AW408063, AI281909, C75026, AI832865, AI587389, AI471534, AA723287, H40410, AI587400, AI683577, AA663306, H72688, AI978792, AA703684, AI206785, AA525209, AW075979, AI110770, AA526193, AA644666, AA262752, AI004591, F23255, AA704643, AA654968, AI570943, AA121919, AW028429, AA368936, AA065087, AA493713, AA449523, AA350859, AW074398, C05999, F37052, AI801482, AA679872, AI377413, AA493632, T40612, AA811580, AA493642, AI284640, AA054106, AC007021, AF094481, Z69720, AC007092, AC007536, AC007114, AC009721, M87918, Z75895, AC002530, AC005940, AF200923, AF118569, AC006530, AC000094, AC000085, AC006397, M63543, X81637, M63544, AC007542, Z98949, U02044, L78810, Z96568, AC005933, AF091512, AL021997, AJ003147, AC005695, AL049780, AC002984, AL079299, AC006441, AL031592, AC005593, AF104670, AC005779, AC005757, AC002288, AL109984, U63721, U78045, AC004892, AL109956, AC004185, AC006468, AF045555, AC002287, AC005245, Z49235, AC004973, AC005018, AC004750, AC004647, AC003111, M87914, AL135744, AC004744, AP000509, AC006237, AL121655, U91319, AB001523, AC010197, Z97054, AL031584, AL031005, AC004159, AC002404, AC005777, Z98051, AC005901, AC004531, |

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|         |     |        |          |           | AF030880, AC007666, AC004972, AL022324, AC006480, AC005368, AC004678, M87919, AC005057, U02058, AL117327, AC005968, AL031177, AL035610, U07561, AC007199, AC005874, AF134471, AL049576, AB023057, AC005261, AL109980, AC005839, AC005291, AL022237, AC005070, AC005829, AC002378, AL034420, AC003013, AL035089, AC005003, M62473, AL117344, Z22650, AC005180, AC008101, Z74739, AC004000, AC005932, AC007285, AL049569, AP000520, AF055066, Z82182, AL035422, AC008079, AL049636, AC005089, AC006285, AL049694, AC005387, Z68322, AF043945, AC005037, AL109952, AC004526, AL035086, Z68273, AF134726, X75159, AC002390, AC007066, AL022311, AC006353, AC007227, AC002347, AC005569, AL031589, AL031594, AP000298, AL109623, AC002477, AL033518, AL022574, AC005837, AC005069, AC009516, AC000083, AL096770, AP000501, AC005015, AC004926, AC002039, AL049757, AC005971, AC002470, AC003681, AC000029, AC005541, AL133448, AL031680, AL021395, AF161343, AL022329, AC007324, L05367, U52112, AF039907, AC005235, AC005562, Z99128, U73024, AC008149, AL022394, AL109654, AC004770, AC004983, I59642, Z84479, Z93023, AL031280, AC004883, AC004228, AC002119, AC002310, AL136295, AC020663, AF038458, AR014240, M59917, AL031848, AL031000, AC004150, AC003080, AP000039, AP000107, AP000044, AC005346, AL050338, AC000052, AC005548, AC005745, AC001053, AC005193, AC004235, AL033525, AC004590, AF001552, AC007628, Z93096, Z75889, AC005361, AF126403, AC004975, Z86090, AC005502, AL031295, AC004933, AL031427, U07563, AC004020, AB023058, AC000353, AL008582, AL133163, AL133500, AC002519, AC006162, AC004019, AC005841, Z30993, AC005324, AC006380, and AC008372. |
| HLQGZ73 | 972 | 856638 | 1 - 592  | 15 - 606  | AA142959, W95902, AI288628, AI367025, AA156599, AI633973, and H40855.   |
| HLQGU11 | 973 | 965781 | 1 - 1004 | 15 - 1018 | AI739061, AA448989, AW170611, AW292930, AI472107,   |

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|---------|-----|--------|---------|----------|--|---|
|         |     |        |         |          |  | AI804333, AI433329, R98898, AW243086, AW000993, AI380481, AI128676, AI078025, Z42061, AI271847, AA704936, N52275, R98672, AA449455, and Z38340.   |
| HLQGP25 | 974 | 893692 | 1 - 511 | 15 - 525 |  | AC004458, AL049759, AL035410, AC005319, AC005277, AL022320, AC005800, Z70281, AL008726, AL135744, AC002312, AC006475, and AC005529.   |
| HLQGP12 | 975 | 969516 | 1 - 904 | 15 - 918 |  | AI076198, AI248210, R08660, R08563, AA386291, AA386292, AA386290, W26527, and AC004913.   |
| HLQGA01 | 976 | 915066 | 1 - 736 | 15 - 750 |  | AI248815, AA778830, and R98466.   |
| HLQFS05 | 977 | 928264 | 1 - 486 | 15 - 500 |  | N25064, and AL133216.   |
| HLQFQ08 | 978 | 961154 | 1 - 485 | 15 - 499 |  | AA976655, AI586970, AW062875, AW207728, T58992, and AC007114.   |
| HLQFE53 | 979 | 856700 | 1 - 855 | 15 - 869 |  | AA399598, and AA054390.   |
| HLQEW11 | 980 | 966019 | 1 - 445 | 15 - 459 |  | W44531, AW080328, W44532, and AI378133.   |
| HLQEN12 | 981 | 969694 | 1 - 634 | 15 - 648 |  | AI624865, AI478349, and AC005336.   |
| HLQEN07 | 982 | 856733 | 1 - 296 | 15 - 310 |  | AA728974, and AC004621.   |
| HLQEM06 | 983 | 934078 | 1 - 306 | 15 - 320 |  | AI610517.   |
| HLQED04 | 984 | 969543 | 1 - 548 | 15 - 562 |  | AW295240, T58758, AW449145, AW024686, AA865601, AI671382, AW129211, AI310515, AI310517, AA582271, T72069, T68855, AA894912, AW294154, AA962431, AW275359, AA862395, R92627, AI245451, AI632011, C20969, AI934344, AI431736, AI493860, AI522042, and AC003034.   |
| HLQDV62 | 985 | 743401 | 1 - 334 | 15 - 348 |  | AI347695, AI884353, AI075047, AA496969, AI051946, AA406632, AI242449, AI248927, AA694032, AI432457, AI656905, H45274, AI802069, AA931335, AW241988, AI914978, AI808628, AI824824, AI808753, AW002992, AA912515, AA490567, and AF072934.   |
| HLQDV01 | 986 | 916190 | 1 - 527 | 15 - 541 |  | AA913936, N72783, and AC007281.   |
| HLQDU64 | 987 | 746435 | 1 - 431 | 15 - 445 |  | R50022, T18597, R29657, D59751, R45895, AI557262, AI557864, Z32887, AA585098, D60844, D59436, AA585325, AI541356, D60765, R28735, R29445, AI526078, AI525500, AI525316, AI541365, R28892, AI541205, AI525556, AI557731, D61254, AA170832, AA585101, D54897, R29218, D57491, AA585439, AI546971, C15737, AA585476, AI557155, Z32822, |

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|  |  |  |  |  | <p> C15406, D53161, R28895, Z28355, C16315, AI557084,<br/> AA585155, C16293, AI546875, AA283326, R28965, R28967,<br/> AI557740, AI526140, C15069, D61185, D55233, AI541383,<br/> AI557734, D53472, AI546999, AI547250, AI547196, D53447,<br/> AI525306, AI557763, C16294, C15120, C16300, D52835,<br/> AI541374, AI541535, C14208, AI547039, AI526184, AI540974,<br/> C16292, AI540903, AI541346, AI557809, AI525431, AI541517,<br/> AI541013, AI557602, AI546945, AI557787, AI526016, Z33559,<br/> C15762, AI546829, AI557727, AI547137, AI541034, C16305,<br/> Z30131, AI525339, AI557408, AA585356, AI526194, AI557718,<br/> R29179, AI541523, AI557807, AI546921, AI541307, AI557808,<br/> AI526191, AI547202, AI535660, AI546996, AI540967,<br/> AI546891, AI541321, AI547006, AI535639, D60730, AI557533,<br/> AI557758, C16296, AI557264, AI536138, AI525320, R29177,<br/> D57186, C14391, R29262, AI525286, AI526109, C14322,<br/> AI525856, AI541527, AA585453, R29172, AI526113, C16290,<br/> AI557279, AI541027, AI556967, T19407, AI526195, AI557238,<br/> AI526024, AI526073, AI526180, AI526112, D51433, D59458,<br/> D54850, AI557039, AA585430, AI525656, T41289, AA514191,<br/> AI526158, AI557852, AA174170, AI557082, AI541345,<br/> AI525332, AI546831, AI541510, AI524904, AA585117,<br/> AI540920, AI541422, T41329, AJ239433, AI541415, AI526117,<br/> C14210, AI546828, AI541506, AI524890, AI557799, AI557041,<br/> AA585434, AI557317, AI547189, AI546901, AA585440,<br/> AI541515, AI557285, AI526187, AI541075, C14723, AI540882,<br/> AI541492, AI541514, AI524891, AI526205, AI546954,<br/> AI541017, D61060, AI541390, AI557786, AI525168, AI526146,<br/> AI541508, AI525653, AI525114, AI557810, AI557796,<br/> AI540944, AI525076, AI541423, AI547026, AI547071,<br/> AI557785, AA585420, AI557802, Z69374, Y09813, AR062871,<br/> A25909, AR038855, Z32836, AR054723, X81969, AJ244005,<br/> Y16359, AF082186, AR038762, D50010, D13509, AJ244004,<br/> A20702, AR062872, AR062873, A20700, D78345, X82786,<br/> A43189, A43188, AR017907, AJ244003, X55486, X76012,<br/> AC005913, A98420, A98423, A98432, A98436, A98417, A98427, </p> |
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|         |     |        |         |          |  | A98767, A93963, A93964, I63120, AJ244006, Z30183, AJ243486, AF006072, AR031358, AR031365, A62298, AR050070, A82595, A82593, AR003381, X82834, AR017826, and AF213384.   |
| HLQDT89 | 988 | 786115 | 1 - 803 | 15 - 817 |  | T96700, T96593, T79642, T79728, and AC011604.   |
| HLQDR89 | 989 | 972425 | 1 - 329 | 15 - 343 |  |   |
| HLQDR47 | 990 | 720145 | 1 - 335 | 15 - 349 |  | R79023.   |
| HLQDR15 | 991 | 660003 | 1 - 563 | 15 - 577 |  | W78833.   |
| HLQDQ72 | 992 | 973258 | 1 - 393 | 15 - 407 |  |   |
| HLQDP33 | 993 | 702276 | 1 - 440 | 15 - 454 |  | AA135279, AA417119, Z98200, AC004800, AC006379, AC005826, Z84487, and AC006449.   |
| HLQDM72 | 994 | 761347 | 1 - 622 | 15 - 636 |  | T98543, and AC002565.   |
| HLQDM03 | 995 | 923862 | 1 - 189 | 15 - 203 |  | AA027217, and AL122007.   |
| HLQDJ01 | 996 | 916193 | 1 - 468 | 15 - 482 |  | AA765420, AI734264, T07769, AA494263, AA828062, AA167792, AA610219, AI287320, AA631480, AA804706, AI205101, AA594072, AA298969, AA491797, AW162442, AA613188, AA480792, AA524829, AA581247, AI733856, AI475616, AA584378, AI056177, AA442176, AA608612, AA410788, AA610494, AA228778, AA640797, AA984114, AA136577, AW327624, AA985391, AI806102, AI086830, AW328172, AW080440, AA811208, AI366464, AL042373, AA608588, AW130093, AW402817, AA773162, AW025074, AI588910, AA665199, AA101113, AI886338, AL031427, Z97832, AP000553, AC005291, AL031729, AC005179, M63543, M63480, M63544, AP000036, AL031120, AC002463, AC005086, AC007687, AC004019, AC004520, AC004131, AC000364, AP000556, L44140, Z97181, AL031311, AC005539, AF047825, AC009363, AC006312, Z95114, AL021937, AC005095, AF086155, AL022238, AC005701, AC006116, AL133304, AL031594, Z82198, AC005261, AC005844, Z85986, Z86090, AC020663, AC004241, AC005971, AC006009, AC005212, AL022336, AC006211, AC007686, AC002483, AL139054, AF104455, AL009178, AP000689, AC005754, AC004491, AC005695, AC005907, AC005940, AL050333, AC006138, AC005803, AL096763, AC004686, AF196969, AC005702, |

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|         |     |        |         |          | AC004000, AC005370, AC005372, AC005041, AL031003, AL13163, AC007676, AC007182, AC004819, AC003681, AC005684, AL031276, AL021939, AL031591, M90058, AC005005, AC007227, AC007860, AL049843, AL031347, AC006539, AB016897, AC005837, AP000563, Z78022, AL035413, AL031284, AC003957, AC006006, AC005484, AL035587, AL008582, AC005488, AC002565, AP000555, U07562, Z75887, AC002301, AC009247, AP000513, AL121825, AC005234, AC008044, AC005952, AF038458, AR036572, U91328, AL096791, AC006047, AC008042, AL009179, AC004525, AL049758, AC002480, Z81315, AC003689, AC005089, AC006115, AL078638, AF030453, AP000211, AP000133, AC007536, AC006406, Z70280, AC006254, AC002549, AL035067, AC007050, AC005747, AL133245, AC000082, AC006409, AC004067, AL035071, AC005527, AC006371, AC005088, AL109799, AF217403, AC004882, AC004589, AC008055, AC007225, AC006547, AL049831, AP000042, AP000110, AC005726, AC004531, Z97054, AC004832, AC003048, AC006327, AC006443, AL024498, AL031283, Z99716, AL023575, AP000509, AP000356, AP000359, AF053356, AC007766, AP000335, AL049747, AL121653, AC004408, AP000345, AC003043, AL023513, AL031685, AL035534, AC006079, AC006120, AF001552, AF002223, AC007055, AF112484, Z83838, AC006581, AC008040, AF196970, AL121603, Z95116, AC005529, AL031680, AC005379, AC005839, AC002553, AC005740, AB023059, AL033527, AL035450, AL049690, AL022328, AC002394, AC002476, AC006536, and AC004817. |
| HLQDI75 | 997 | 856759 | 1 - 326 | 15 - 340 | AI784258, AI003123, AA558404, AA857622, H59611, H59651, AI240755, R01574, AA632757, AA595554, AI187080, R98409, AA984920, R70883, R70884, AA602574, AA553579, AI566236, AI749306, D51809, F33820, AA385775, AI051539, AA371003, AA371410, AA501807, AA737523, T07420, AI567391, R77715, D51877, AA468058, T92803, AI282629, AA847499, F23268, AA384911, AW237905, F31575, AW302078, N70222,  |

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| M76423, AF061153, AF064105, AF031403, U04737, I17291, X83604, AB017568, I08101, I08711, M24461, L34219, Z68617, Z68869, AP000229, AC004035, AC004258, AC005362, AP000699, AC005602, AC002314, AC006132, AF044083, AP001063, AL031007, AL035462, AP000300, U89335, AP000241, AL109952, AC004447, AC004031, AC004131, AL008712, AL096757, AC005318, AC007639, AP000045, AP000113, AP000504, AP000144, AP000503, AP000201, AC004230, AC006597, AC004893, AL031677, AC001226, AF124731, AC004003, AP000466, AL031657, AC005273, AL109984, AL109967, AC004638, AC004933, AP000097, AC007032, AL022395, AF207550, Z95115, AC004477, AC001231, Z97206, AC007690, AL121603, Z92542, AL096791, AC004616, AL122020, Z74696, AC006197, AC004383, AC006466, AC005666, Z82194, AC007688, AC005837, AC005747, U96629, AL023807, AL021917, AC012085, AC005695, U52112, AC005772, AC007538, AC008041, AF134726, AF129756, AC004106, AC005768, AL049776, AL022318, AF117829, AC009263, AC006236, AC018833, AL022330, AC004650, AC006468, AL022334, AL079304, AC003030, D45180, AD000091, AP000251, Z98750, AL022316, AP000212, AP000134, AP000030, AF196970, AC007276, AC003685, AL035684, AP000564, U73024, AC007684, AC004032, U91318, AC003025, AF139813, AP000501, AC005239, AC003029, AL117344, AC004020, D87667, X71402, AR037563, X58377, U02051, AF155118, L81761, AF042835, AF208500, M22970, AC000955, L81772, AL049729, AF061152, AF069074, M81890, AR060470, U22028, A47886, X69953, U65896, D14034, AF102137, X89398, AF184614, AC002049, AP000288, Z81144, Z68128, U29953, AP000286, AC000024, Z46936, AC002481, D87011, U80459, AL117330, AF106918, AC000094, AC005338, AC007096, Z70224, I96182, L76568, AL008708, AC004185, AC006047, Z82171, Z82173, AB014085, AC004449, AC008975, Z97183, AC005266, AC004036, Z54072, Z68756, AL049198, AC005203, AC004475, AC005563, Z81367, |  |  |  |  |  |
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|---------|------|--------|---------|----------|--|---|
|         |      |        |         |          |  | AC004602, U63963, AD000813, AC006293, AL031346, AC004791, AL109801, Z84496, Z82172, AC004187, Z98047, AP000558, AL008719, AC004042, AC004013, AC005179, and AC004749.   |
| HLQDF69 | 998  | 754302 | 1 - 407 | 15 - 421 |  | AI741424, AW379392, AI203575, and AI522301.   |
| HLQDF27 | 999  | 682896 | 1 - 224 | 15 - 238 |  |   |
| HLQDE32 | 1000 | 707639 | 1 - 742 | 15 - 756 |  | R13823, T31214, AA101560, Z25135, R61709, R35616, AA333729, and R94706.   |
| HLQDC02 | 1001 | 919611 | 1 - 507 | 15 - 521 |  | AW444819, AI223138, AI809436, N94628, AI869757, W23828, C01878, and AA320959.   |
| HLQDB69 | 1002 | 934462 | 1 - 494 | 15 - 508 |  | H84572, AA921736, C14111, AA193066, AA279233, Z44100, and AL137527.   |
| HLQCZ83 | 1003 | 781052 | 1 - 373 | 15 - 387 |  | AA004424.   |
| HLQCZ46 | 1004 | 871684 | 1 - 951 | 15 - 965 |  | AI935557, N53561, AI435571, AW104342, AI628733, AI950465, H57932, AA701378, AA410255, W86579, N91619, AA705304, AI239546, R85396, T54915, AA928077, R59888, R40761, AI076347, N68729, AI056635, AI910761, AI492415, AW299867, H58023, R59629, AA406529, T95812, H19427, AA689340, F09287, W86712, Z40128, T55082, T95811, F01868, N72520, and AL109938. |
| HLQCY79 | 1005 | 774827 | 1 - 581 | 15 - 595 |  | W02640, H66605, N74443, T86668, N74391, R91408, R92668, H66604, H47090, H78955, W03155, H47124, and AC004139.   |
| HLQCS58 | 1006 | 735841 | 1 - 484 | 15 - 498 |  | AI091581, AA458633, AA455537, and AL022395.   |
| HLQCCQ9 | 1007 | 625412 | 1 - 420 | 15 - 434 |  | AW449242, AA193381, AI343478, AI074563, AI143834, H66591, R02833, and AL031428.   |
| HLQCF89 | 1008 | 689673 | 1 - 749 | 15 - 763 |  | W85886, AI311917, AW237344, T86920, R02060, and W85970.   |
| HLQCO19 | 1009 | 668521 | 1 - 609 | 15 - 623 |  | T89987, and T87169.   |
| HLQCK45 | 1010 | 488499 | 1 - 860 | 15 - 874 |  | AA186729, H78234, H78434, R97547, AA628115, and AA992226.   |
| HLQCI96 | 1011 | 823602 | 1 - 446 | 15 - 460 |  | H70404, W67241, AI807620, AW170393, AI148673, AI700503, AI951537, AI418406, AW027328, AI372906, AI978898, AI355972, AA804574, AA577153, AA683135, AI375779, AI421626, AA922646, R50491, AW083779, AI086894, R71660, R70331, R80971, H45696, H04767, H50348, AI149104,   |

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|---------|------|--------|----------|-----------|---|
|         |      |        |          |           | AA350063, AI000283, AI336304, H04863, AA454614, AA948638, H48164, AA158079, N30114, AA040055, AA100734, H14248, H41004, H03390, AA935502, AW085023, AI873952, AA953342, R71761, AA488228, AA350336, R71772, AA330664, AA350335, AA558800, T47929, H21988, AI185581, AI355331, AA350333, W42753, N92553, AA380748, R80075, AA349208, AA366768, AI498026, AA488175, R79976, AI362566, AI372422, AA974799, H04088, R48548, AW247533, H52808, AA364212, H19508, AA380728, AI611852, W67185, AA313213, R24504, AA890444, R35881, N42220, AW381755, AA350334, AA455790, AA317877, AA188900, AI910306, W42696, AC006165, AB023051, AP000512, AF117234, AF085357, AF089750, U60976, U60977, AF145044, and U90435. |
| HLQCH67 | 1012 | 751481 | 1 - 692  | 15 - 706  | N74195, AI021972, W01177, AI076389, AI248034, and AC006977.   |
| HLQBS59 | 1013 | 566772 | 1 - 1256 | 15 - 1270 |   |
| HLQBQ19 | 1014 | 671928 | 1 - 365  | 15 - 379  | H67959.   |
| HLQBF91 | 1015 | 790408 | 1 - 522  | 15 - 536  | N50005.   |
| HLQBD38 | 1016 | 948694 | 1 - 458  | 15 - 472  | AI217956.   |
| HLQAX31 | 1017 | 693626 | 1 - 661  | 15 - 675  | N76167, N64759, and AC002452.   |
| HLQAP90 | 1018 | 787240 | 1 - 276  | 15 - 290  | T39322.   |
| HLQAO31 | 1019 | 698385 | 1 - 529  | 15 - 543  | AA007275, R94668, W85761, R11426, AA677068, AA007276, AI033796, R94669, and R19176.   |
| HLQAN75 | 1020 | 880815 | 1 - 474  | 15 - 488  | R96337, H93374, H52073, AI278166, H83689, R44303, H52072, AI290552, R96336, and AF193806.   |
| HLPBA84 | 1021 | 912828 | 1 - 536  | 15 - 550  | AI057011, AA634414, AW062302, AA368329, AA507990, AW029626, AI114755, AI888050, AA351868, AA454041, AA773560, AL047480, AA015948, AI799421, AI337612, AA315052, AW439724, AA368659, F34151, H87756, AI620666, AA101744, F31575, AI298079, AA984829, H15241, AL034424, AC006317, Z82176, AL121603, AL132992, Z82195, AL096701, AL122020, AL121595, AC006312, AL022165, AL080243, AC006992, Z99716, AC007285, AC002554, AC005620, AC007546, AL080316, AL021707, AC008012, AL031655, AC004859, AL035458, AL031848, AC005972, AC005399,   |